A CHILTON PUBLICATION UNIV. OF MICHIGAN

NATIONAL METALWORKING WEEK & Y95

December 3, 1953

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Ohio Ferro-Alloys Corporation Canton, Ohio

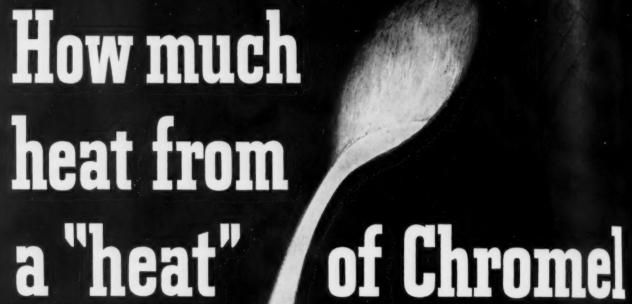
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Twenty-five years of service to the iron and steel industry
1928 - 1953



You've seen molten metal before . . . but chances are you've never seen a "heat" that's more closely controlled as to composition and quality than the one you see above. For this is a heat of Hoskins Chromel . . . the original nickel-chromium alloy that first made electrical heating practical. Into it go precise amounts of the purest raw materials obtainable ... mixed, melted, and poured in exactly timed cycles.

And from it, ultimately, will come approximately 1200 pounds of fine finished material . . . smooth, bright, durable wire or ribbon produced to a specified resistivity for long, dependable service as heating elements or cold resistors in countless different electrical devices.

Chromel, however, is only one of many specialized, quality-controlled alloys developed and produced by Hoskins. Others include: Alloy 502 . . . used throughout industry for a wide range of heat resistant mechanical applications. Spark plug electrode alloys ... which have become universally accepted standards of quality and durability. Alloy 717 . . . used in facing engine valves for longer life and improved service. And, of course, there are Hoskins Chromel-Alumel thermocouple alloys for industrial furnaces and jet engines . . . unconditionally guaranteed to register true temperature-e.m.f. values within close specified limits.



Heating elements made of Hos-



long dependable service wherever they're used.



Hoskins Chromel-Alumel thermocouple alloys accurately register exhaust temperatures

HOSKINS

MANUFACTURING COMPANY

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Tool Steel Topics



BETHLEHEN

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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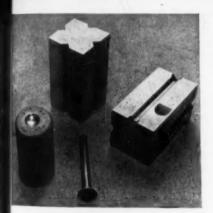
ENCIL SLIPPED

ne of our customers reported his coldeading dies were cracking and spalling. he spalled areas appeared to be the realt of the hard case upsetting into the ofter core.

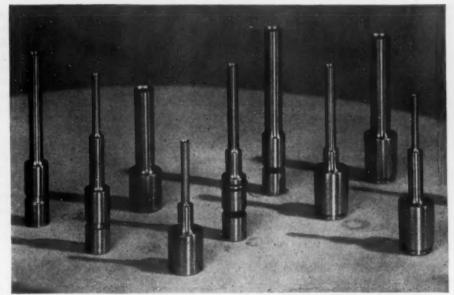
Our metallurgical contact man who isited the customer's plant couldn't find arthing out of order, until he happened oread over an order the customer had attend for the steel. Then the light began adwn.

The answer? The customer had failed a specify "cold-heading die quality" on the order. There's quite a difference between ordering "carbon tool steel" and cold-heading die quality steel."

It's the difference between a tool steel hat's processed for doing a fine job on evere cold-heading and steel that just sa't suitable for this type of special application.



he gripper and header dies shown above, made of latishem XX Cold-Heading Die Steel, have the right ombination of hard surface and tough core for coldhading thousands of steel bolts each day.



"Even the roughest kind of service in binderies and printshops won't break paper drills when they're made of Omega tool steel," says William Gynther of Bent and Gynther, Portland, Ore.

OMEGA HELPS TO STOP BREAKAGE OF PAPER DRILLS

Drilling holes through paper may sound easy, but it isn't. Printers who do much paper-drilling will tell you that the drills often break and bend.

The other day we were given quite a fill-in on the subject by William Gynther, one of the owners of Bent and Gynther, Portland, Ore., suppliers of drills to the printing trade. Mr. Gynther told how he once noticed four broken drills on the desk of a prospective buyer. He made a wager that his drills wouldn't break, even though this printshop apparently gave the drills pretty severe treatment. The

printer took him up—and hasn't broken a drill in some years.

The success of the "B and G" drills is attributed by Mr. Gynther to the unique taper inside the drill and to the grade of tool steel (Bethlehem's Omega). Omega is our silico-manganese grade of shock-resisting steel, and while it is intended mainly for cold-battering tools where terrific shock must be absorbed, it appears to have the ideal hardening properties for these paper drills, together with plenty of the toughness required to withstand stress and strain.



BETHLEHEM TOOL STEEL ENGINEER SAYS:

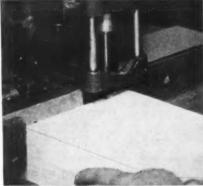
Always temper immediately after hardening

It's always risky to delay or to omit tempering immediately after a hardened tool cools following the quench. With a liquidquenched steel always get the tool into the tempering furnace as soon as it cools down to about 150 to 200 F; an airhardening steel should cool to 150 F.

Some heat-treaters spit on a tool—if there's no sizzle, it's cool enough to temper. You can also use a contact pyrometer or other indicators to get a more accurate check on the temperature of freshly quenched tools.

If you delay the temper—to check hardness or for some other reason—you're running the risk of permitting stresses to build up. And these stresses may crack the tool in half, even before it reaches the tempering furnace. Of course, such failures don't always occur if this precaution is ignored.

Some people just can't be convinced that it's risky to delay tempering after the tool cools following the quench. But there's no way to predict just when it may happen, so why take the risk?



Boring holes through a stack of paper doesn't sound like a tough job, but there's a lot of stress on these hollow drills which causes frequent breakage unless they're made of the right steel.

the Iron Age

Vol. 172, No. 23, December 3, 1953

*Starred Items are digested at the right.

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NEWS DEVELOPMENTS

TELL WHY M-47 TANK GEARS BROKE DOWN — P. 106
Responsibility for defective gears that lead to breakdown of M-47 tanks and production stoppages was
traced by The Iron Age to technical difficulties arising
from an alloy switch necessitated by the nickel shortage. Ordnance takes sting out of accusations. Aim
was to speed tank production.

QUERY INDUSTRY ON BIRTHMARKS FOR METALS—P. 112 Government-proposed military standard for birthmarking steel and other metals is making rounds of industry. Ask producers, fabricators if proposed standard should be adopted. Decision is unlikely soon. Extra cost scares some. Steel producers, while not opposed, raise many questions on necessity, advisability.

AIR COOLER SALES THRIVE IN SOUTHWEST — P. 116
Low cost evaporating air coolers are a \$50 million metalworking industry in the American Southwest. Manufacturing is centered in Phoenix and Los Angeles, with
bulk of domestic sales in that area. Export markets
are expanding, but all sales are generally limited to
hot very dry climates yielding proper evaporation.

DEFENSE SPENDING TO DOWNTREND SLOWLY — P. 118 Course of defense spending is pretty well charted until June, but Pentagon officials are keeping mum about its trend thereafter. A decline is probable, but gap between orders and payment will delay recognition of the dip for some time. A reduced budget seems definitely in the cards, and a big carryover is hoped.

BIGGEST BUDGET CUTS FOR FOREIGN AID — P. 127 Agreement has been reached between Administration and congressional leaders that biggest cuts in next year's spending estimates will hit foreign aid. Defense spending will also feel the knife—but cautiously. May save \$1 billion with 10 pct military manpower cut. Elections may stall Taft-Hartley rewrite.

DOWNTREND CAN BECOME POLITICAL BATTLE — P. 135 You may indirectly be enmeshed next year in a political battle centered on production and employment. If any fair-to-middling downtrend materializes, unions and Democrats will ballyhoo it for elections. Groundwork is being laid. But continuing high employment can paralyze any such assault.

he Week in Metalworking

ENGINEERING & PRODUCTION

P. 105

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BEND PROPERTIES OF TI CAN BE IMPROVED—P. 165
Bending properties of titanium strip can be improved
by removal of a thin layer of surface metal. Embrittlement from oxygen and nitrogen pickup during hot
working can be removed by pickling. Good bend properties have been obtained after removal of 0.001 in.
surface from light strip.

MODERN PRESSURE EQUIPMENT VERSATILE—P. 168
Hydraulic presses handle many assembly jobs accurately. Fitting, crimping, riveting, staking and other
pressure methods are done with low breakage and high
production. One tough staking job has less than ½ pct
rejects. Many parts are sometimes blanked, formed
and assembled on an automatic machine in one stroke.

SPRAY ON ABRASION RESISTANT COATINGS—P. 172 Low carbon steel plungers used in pumps supplying river water laden with grit, dirt and mill scale have lasted 1½ years without appreciable wear. A powdered nickel-base alloy is sprayed on the plunger to give a low-friction surface. The powder is fusion bonded by oxyacetylene heating after spraying.

INTEGRATED HEAT TREAT UPS PRODUCTION—P. 174 Careful integration of heat treating and broaching operations has helped one Midwest manufacturer cut costs of parts made from forgings. Both production rates and quality have been improved. Modern heat treating facilities and better methods played a big part in improving production.

NEXT WEEK-SPECIAL WELDING ISSUE

Answers to a host of welding problems will be found in an issue devoted entirely to welding. Here you'll find data on latest developments in: Handling of "hard to weld" materials. How to get the most from maintenance welding operations. What one plant's doing with jigs and fixtures.

Biggest bonus will be The Iron Age Welding Rod and Electrode Chart. Scope of the widely used chart of comparable welding electrodes has been considerably broadened to increase its usefulness. Data in the new chart will be of considerable help in the selection of materials for welding carbon and stainless steels, aluminum, copper and other metals.

MARKETS & PRICES

FARM EQUIPMENT MAY HOLD AT '53 LEVEL — P. 111 Weather and prices permitting, the outlook for farm equipment sales in 1954 is mildly optimistic. That's the forecast of salesmen who met in Chicago last week. They point to high farm savings accounts, possible break in droughts, thinning dealer inventories. But cautious purchasing agents cut steel orders.

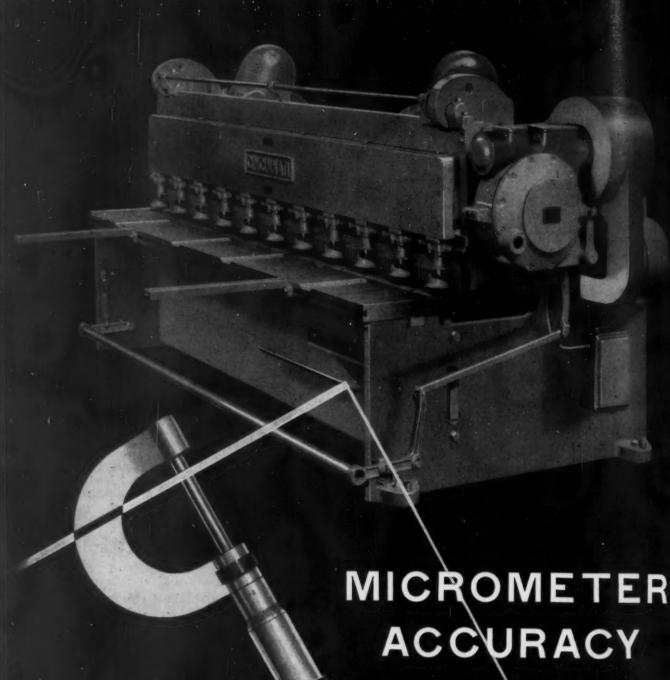
QUOTE STEEL PRICES ON DELIVERED BASIS — P. 113 Republic Steel Corp. will soon introduce a new method of quoting delivered base prices on hot-rolled carbon bars. The firm's "county symbol" method should grant substantial relief to customers harassed by computing complex freight costs. A system of symbols gives delivered prices from various mills to consumers.

PREDICT HIGH SALES FOR LOW PRICE CARS — P. 122 W. E. Fish, Chevrolet sales manager, last week analyzed the 1954 auto market as he sees it. He forecast that low priced models will take a larger share of the market, probably approaching the prewar figure of 60 pct. Overall sales should be nearly equal to '53, but customers will buy carefully, with an eye on cost.

BUILDERS MUST WOO REPLACEMENT MARKET — P. 133 There are plenty of facts to convince machine tool builders and buyers alike that much equipment now in use is obsolete and should be replaced. Biggest potential replacement market is among small to medium sized shops which want flexible, moderately priced tools. Spotlight design trends.

STEEL PEOPLE BANKING ON STRONG FIRST HALF—P. 221 Steel sales people who visit Detroit leave with optimism intact. Both Ford and Chevrolet have scheduled first quarter production runs higher than for the first 3 months of this year. If they are overly optimistic and sales falter, steel companies will feel it quickly. Inventories are still a tough problem.

AIR FORCE ASKS VAST TITANIUM EXPANSION — P. 224 "Woefully weak" is Air Force Secretary Talbott's description of titanium supply. Current production rate is 2300 tons per year. Air Force wants 35,000 tons annually by 1956, says it would need 100,000 tons annually in the event of all-out war. GSA has contracts for 13,800 tons of capacity.



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Society of Business Magazine Editors





Publications

Editorial



FOUNDED 1855

You and the FBI

THE metalworking industry—and all industry for that matter—has a big stake in the Federal Bureau of Investigation. With its help and checking, industry has kept dangerous Communists from learning top industrial defense secrets.

It is fair to say that without the integrity, devotion and high grade work of the FBI, industry would have had serious trouble with hard core Communists and neurotic sympathizers.

Today your FBI is being unfairly criticized in some quarters. There are those who would have you believe that FBI director, J. Edgar Hoover, has been playing politics. Nothing could be farther from the truth. Neither he nor his department plays politics.

Mr. Hoover made every effort to keep out of the Harry Dexter White case. For a great number of years Mr. Hoover and his aides have taken pride in the integrity and nonpolitical nature of the FBI.

That pride was hard won. It took years for the department to reach its present state of public acceptance and trust. It is fair to say that Mr. Hoover is responsible for the success of the FBI.

That pride was punctured by stories to the effect that ex-President Truman was carrying out the wishes of Mr. Hoover by keeping White in government service. Yet the director spoke up to the Senate committee on orders of the Attorney General, his boss. Even then he limited his own testimony to his participation in the case.

On Feb. 21, 1946, Mr. Hoover in answer to a direct question from the then Attorney General, Tom Clark, stated that he (Hoover) thought "it would be unwise for White to serve" in a government job. That effectively took care of the story that Mr. Truman was acceding to Mr. Hoover's wishes in keeping White in government service in order to keep an eye on him.

The points we make are:

- ¶ Your FBI is important to you, your firm and your country.
- The integrity of the FBI and its remoteness from politics are exactly the same as they were before the White case broke out.
- Those who are "gunning" for Mr. Hoover and the FBI are guilty of a disservice to their country.

Mr. Hoover has said his piece—we have said ours. We believe it is absolutely essential that industry support the FBI to the hilt at all times. Only by doing that can we help maintain the high standard of efficiency, honesty and patriotism now prevailing at FBI.

Tom Campleece





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you

Manufacturer of Suitcase Frames Solves Rust Problem with Galvanite

One of the oldest and largest manufacturers of steel frames which are used in the construction of soft side luggage has recently switched to Galvanite* to eliminate japanning and a rust condition that had been a production headache.

The company found that by using Galvanite* they could eliminate painting and disregard the rust possibility. They found, too, that Galvanite* formed with all the ease of plain steel and took a 90 degree channel bend without flaking or peeling.

If you are using, or plan to use, coated metals it will pay you to find out why more and more manufacturers are switching to Sharon's popular special process zinc coated Galvanite*.



Send for your copy of Sharon's New

Galvanite* Handbook

*Trade name copyrighted by the Sharon Steel Corporation



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-11/4

Wherever Rust is a Problem-Specify Galvanite

SHARON STEEL CORPORATION Sharon, Pennsylvania

Dear Editor:

Letters from readers

Extrusion Presses

Sir:

I read with interest your article in the Nov. 5 issue of THE IRON AGE, entitled "Fabricators Install Extrusion Presses for Quick Service." I was particularly interested and would like to call your attention to the last paragraph on the first page of this article wherein you say, "billets are usually carried through a gas-fired furnace on a stop-and-go endless chain conveyor in an end-to-end position."

Our company is engaged in the manufacture of 60-cycle induction billet heaters that compete with this gas furnace. In view of the fact that every Watson-Stillman press manufactured since the end of World War II, except the one about which you are writing, and practically every other extrusion press put into service since that time, has been equipped with induction billet heating, this statement seems a little erroneous. We are calling it to your attention, since the statement you make is rather broad and is not accurate.

J. A. LOGAN President

Magnethermic Corp. Foungstown, Ohio

This article described one particular installation. A complete article on induction billet heaters has been in preparation for several months and is scheduled to appear soon.—Ed.

Bimetallic Water Heaters

Sir:

Your article entitled "Bimetallic Water Heaters Brazed for Strong, Tight Joints," which appeared in the Nov. 5 issue, p. 176, interests me very much in respect to the Gasfluxer. Please advise who manufactures this item or where we can get more information on it.

 $R.\ WETHERHOLD$

Air Products, Inc. Emmaus, Pa.

The manufacturer of the Gasfluxer flux dispenser is the Gasflux Co., 195 Wayne St., Mansfield, Ohio.—Ed.

Powder Parts

Sir:

A rather important article on powder metallurgy appeared in your July 30 issue. The article was entitled "New Process Gives Unusual Powder Parts" and appeared on p. 98.

We would like to obtain a tear sheet of this article.

Lake Or

T. H. LASHAR Chief Metallurgist

Hydraulic Scale

Sir:

In the May 28 issue of THE IRON AGE we found the following item: "Weighing has been speeded with a direct reading hydraulic scale now available for one fork truck. Loads up to 4 tons are measured on pickup to within 0.02 pct accuracy."

We would be obliged if you could give us the address of the company to contact in regard to this item.

M. LAUPSIEN

Verlag Handelsblatt Dusseldorf, Germany

Further information about the fork truck equipped with a direct reading hydraulic scale may be obtained by contacting the Yale & Towne Mfg. Co., 405 Lexington Ave., New York 17, N. Y.—Ed.

New Roofing Adhesive

Sir.

In your Nov. 5 issue, on the Newsfront page, you mention the need for a fire-retardant roofing adhesive.

We have developed a compound that might readily be adapted to such a use or modified to meet the requirements. We would appreciate information on who to contact or where possible specifications might be found.

E. M. BALTUFF Physical Research

Bemis Bro. Bag Co. Minneapolis, Minn.

Further information about a fireproof or fire-retardant adhesive for factory roof construction may be obtained by contacting the Ford Motor Co., 3000 Schaefer Road, Dearborn, Mich.—Ed.

Steel Industry Capacity

Sir:

Would you please send us one reprint of the "Official Steel Industry Capacity" chart which appeared in the Jan. 29 issue on p. 56?

P. MORRISON Librarian

Canadian Industries Ltd. Montreal

Yes. we still have a few more of these reprints in stock.—Ed.

Cold Extrusion

Sir:

On p. 93 of your Aug. 4, 1949 issue, you featured an article on the "Cold Extrusion of Steel" by E. S. Kopecki and T. E. Lloyd. Will you please send us a tear sheet of this article, if still available?

HAROLD SIEDMAN Chief Engineer

Nutt Mfg. Co. Lake Orion, Mich.

Tear sheets and reprints of this basic article are now exhausted.—Ed.



Really those tickets are tags we attach to customer shipments here at Kenilworth to identify specific strip steel products. One is a true precision cold rolled strip steel with qualities and characteristics best for many fabrication jobs; the other is cold rolled sheet coil slit to width and also just right for many jobs. We stock and sell both -there is no argument-but we sell and identify each one for what they are and try to help you decide which is best for your need. Well, you should expect that from a specialist in flat rolled metal productsbut, if you're not acquainted with this kind of service we would like you to know it's typical of Kenilworth's interest in every inquiry and order. Try us today.



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BALTIMORE & OHIO RAILROAD

Bituminous Coals for Every Purpose

Fatigue Cracks

by William M. Coffey

Outside The Iron Age

Being a frustrated Chief Bosun ourselves we are most gratified to find from various sources that so many of our subscribers are of the same mind. So the following is printed for the benefit of all the seamen in the crowd and is especially dedicated to those whose experience runs to leaky boats.

This is an extract from a letter to Sir Joseph Banks from Lieut. Clerke, First Lieutenant of H.M.S. Resolution, after that ship underwent a navy yard fitting-out to accompany Capt. James Cook on his voyage of discovery to the Antartic in 1772. Banks was a scientist who had alterations made in the ship to help his scientific observations.

"She is so very bad that the pilot declares he will not run the risk of his character so far as to take charge of her farther than the Nore without a fair wind; that he cannot with safety to himself attempt working her to the Downs. Hope you know me too well to impute my giving this intelligence to any ridiculous apprehension for myself. By God, I'll go to sea in a grogtub, if required, or in the Resolution as soon as you please; but must say I think her by far the most unsafe ship I ever saw or heard of. However, if you think proper to embark to the South Pole in a ship which the pilot (who I think by no means a timorous man) will not undertake to carry down the river, all I can say is that you will be most cheerfully attended so long as we can keep her above water."

Inside The Iron Age

Of course, all our readers are not inclined seaward. In any group of 120,000 people you'll find different species, types and sizes. Here are letters from two of our most ardent admirers.

Dear Sir:

Our class is working on a unit of "Iron and Steel." We are searching for any information such as, its origin, development, where found, samples, finished products, literature, pictures and etc.

Hoping you will help us. Thanking you in advance.

> Very truly yours, Sallie Mae Jones 6-H Grade

Dear Sir:

Will you kindly send me some information and pictures on iron. I have a forty-page report to make for school in Science. So far I have been unable to pass the subject.

Thanking you, I am Joseph Shelmet Grade 9B

We can't guarantee that Joseph will finally pass Science, but our Readers Service Department will do their best.

We have still other types of readers. Here's a poem from a type we particularly like. Our advertising department in a printed brochure made a "typo." That's a mistake in printing, misspelled word or something. Mr. Frank Childs of the Philadelphia Quartz Co. extends his sympathies:

Proofreader's Lament

If all the salt
from all our tears
Could quietly season
mistakes and fears
Our table would abound
with "pferds"
While we silently sat
and ate our words.

Note: Don't ask us what "pferds" means. We checked the printer and he doesn't know either. But, what the heck, it rhymes with words. How about this, Mr. Childs?

Puzzlers

It would take Eustace 12 days to do the job (Nov. 12 Puzzler). Winners: Clyde R. Weihe, Norman Mecklem, G. A. Alsterlund, Albert Alles, Milo Bowman, Mark L. Perucich, Betty Thomas, F. P. Reagon, Herman Donovan, Robert Henry, F. H. Kissner, Ruth Harris, Ray T. Ernst, Everett F. Damon, David Hinds, Joseph Furman, T. F. Goodwyn, Donald Holden, John Hoge and Mr. Rice.

New Puzzler

Jacques Martineau sends us one with a familiar ring, but for the benefit of our new readers, here it is again:

Five Eskimos went fishing. After one week they decided to divide their catch equally amongst themselves, each taking one fifth of the total number. But not trusting each other, during the night one of them got up, divided the large pile of fishes into five equal piles, threw away a remaining fish, took his share, put the other four piles into one and went back to sleep. Another got up and did likewise, threw away a remaining fish, took his share and put the other four piles into one and went back to sleep. And so on for the third, the fourth and he fifth Eskimo. The next morning, the remaining pile was divided equally among the five Eskimos and this time none was left over. How many fishes did the five Eskimos catch?

now you can produce trouble-free,

FREEMACHINING STEEL with FOOTE MANGANESE SULPHIDE

This fume-free ladle additive increases quality and reduces the cost of producing high sulphur, free-machining steels . . . with these plus advantages:

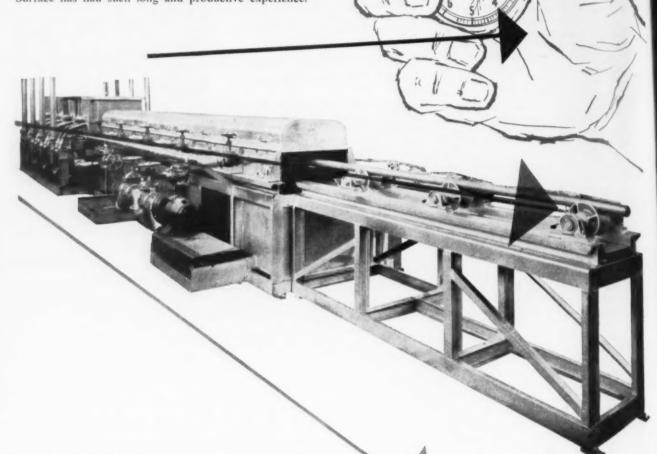
- 1. improved hot rolling behavior
- 2. fewer surface defects
- 3. fewer diversions
- 4. lower conditioning costs
- 5. low carbon content saves heat time

TYPICAL ANALYSIS
Manganese 53%
Sulphur 32%
Carbon .22%
Size: 1" x 5" lump

write for further details!



438 Eighteen W. Chelten Bldg. Philadelphia 44, Pa. 20-foot welded steel tubes travel through this Surface Combustion High Speed Furnace with stop-watch precision at the speed of 120 feet per minute, fast enough for any production line. Such speed requires high heat input (the tubes heat to 650°F. in 6 seconds) which, in turn, demands split-second control of the "time exposure" in the heating chamber. This presents the kind of heat engineering and materials handling problems with which Surface has had such long and productive experience.



eliminate heat treat bottlenecks. They are designed in many sizes for a wide range of processes on ferrous and non-ferrous metals. They can be automatic or semiautomatic, gas or oil fired. Write for Literature Group H53-5 and see how these "hot-rod" furnaces can give you savings in heating time, equipment cost, fuel, maintenance, floor space, metal, and labor.

Surface High Speed Furnaces fit into the production line,

HEAT TREATING EQUIPMENT

CORPORATION

ALSO MAKERS OF

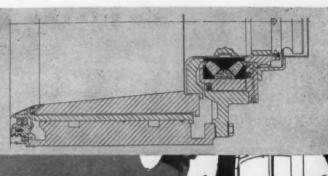
Kathabar HUMIDITY CONDITIONING Janttrol AUTOMATIC SPACE HEATING

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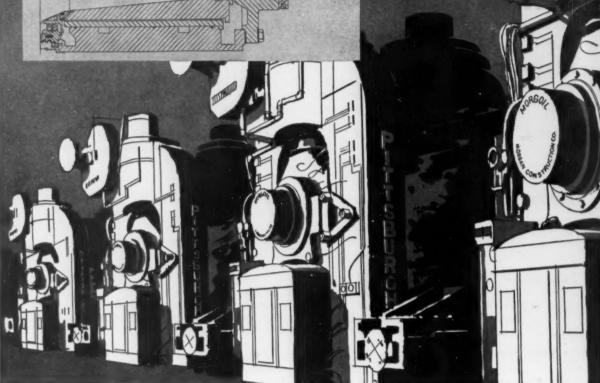
THE IRON AGE Newsfront

- SOUND SILVER-BRAZED JOINTS in 430 stainless steel are now possible with two new nickel-rich alloys. The new alloys answer the problem of susceptibility to separation under mildly corrosive conditions. A nickel-rich layer is deposited at the interface.
- BIG BATTLE FOR POWER STEERING ON TRUCKS is shaping up. It will feature air versus hydraulic, with air power holding a slight prebout edge. Many trucks already carry a small compressor for air brakes.
- A TITANIUM AIRCRAFT LATCH has been successfully poured in the laboratory using the frozen mercury process. A regular Mercast mold for a 10-oz steel latch and a special ceramic shell were used.

 Results: There may be a solution to the problem of the high rate of reaction between titanium and investment materials.
- FREIGHT ABSORPTION IS NOT SO SIMPLE, some steel producers have found. The many complex problems that have arisen since adoption of this policy involve some tricky decisions. Many consumers are strangely apathetic and some are sticking with distant suppliers who helped when closer sources refused.
- A NEW METHOD OF PRICING STEEL will be introduced by Republic Steel Corp. about mid-December. The "county-symbol" method will enable salesmen and consumers to tell delivered cost of hot rolled carbon bars at a glance. Method may eventually be applied to all products.
- BIG AUTOMOTIVE FIRMS ARE ADDING constantly to the number of engineers and technicians engaged in development work. Technical advances in the next few years from this all-out effort may even surpass remarkable achievements of the past few years.
- FARM EQUIPMENT MANUFACTURERS are beginning their fall buying of raw materials for spring machinery sales. Total purchases may fall 10 to 25 pct below last year's levels for the same period.
- HOT TOP PLATE, badly needed by tank manufacturers, may be easing. Apparently affected by shell line slowdowns, the item has been recently offered in increased tonnages to Midwestern customers.
- SUSPENSION AND RIDING QUALITIES will soon receive new emphasis from automotive engineers. New engine programs will be completed in most cases in 1954 and 1955 and many automakers want to take the heat off horsepower in any case.
- COMMERCIAL GRADE, LOWER COST ZIRCONIUM is expected to be available in fairly large quantities for industrial use within six months. Reports are that 500 lb ingots now being made will soon be surpassed by 1000 lb ingots. Price will be competitive with tantalum. Big field will be for corrosion resistance applications in the chemical and electronics industries.
- SO-CALLED LOW PRICE CARS will soon offer all the mechanical advantages of the luxury models. These include electric window lifts, seat adjusters and other devices as well as power steering, power brakes and other "luxury" appliances.



TORRINGTON steep angle Tapered Roller Bearings, mounted with Morgoil bearings, handle axial thrust loads smoothly on the Pittsburgh Engineering & Machine Company 4-high hot strip mill built for Detroit Steel Corporation's Portsmouth Division.



For peak efficiency

TORRINGTON Bearings are solving an increasing number of the problems posed by the heavier loads and higher speeds of today's steel mill equipment.

They carry the heavy thrust loads encountered in the high speed of the 4-high rolling mills. Engineered to meet these conditions, the steep angle construction guarantees maximum thrust capacity.

There are TORRINGTON Bearings to handle any combination of thrust and radial loads. They are



and lower costs!

available in a complete range of types, including cylindrical, tapered and spherical roller bearings.

Precision-ground races and rollers assure minimum friction, high capacity

and long service—giving you maximum return for your bearing dollar.

It pays-to use TORRINGTON BEARINGS!

THE TORRINGTON COMPANY
South Bend 21, Ind. Torrington, Conn.

TORRINGTON

TAPERED ROLLER

BEARINGS

Spherical Roller . Tapered Roller . Cylindrical Roller . Needle . Ball . Needle Rellers

104

THE IRON AGE



TANKS: Why Gears Broke Down in M-47s



M-47 tank gear breakdowns caused by technical difficulties stemming from nickel shortage . . . Ordnance takes sting out of accusations . . . Aim was to speed tank production.

Responsibility for defective gears that led to breakdown of U.S. combat tanks in Europe and production shutdowns on the home front was traced by IRON AGE to technical difficulties arising from specifications changes necessitated by the nickel shortage. Continuing a program to conserve scarce but war-vital alloys, nickel content of the gears was thinned—and heat treating, other problems resulted.

Switch to Leaner Alloy

Following a statement by one of its officers that certain plants did not rigidly adhere to specs, Ordnance retracted the sting of original accusations by an official statement which read: "These failures apparently occurred because in the early period of the M-47, in order to speed production and overcome critical shortages of materials, the manufacturers made some production changes. These at first resulted in shortening the life of the final drive, but manufacturers immediately made corrections to improve the life of this part."

Ordnance claims both the Army

and producers knew that gears made of a leaner alloy might not be of consistent quality. But policy was to get usable weapons into the field without waiting for desirable refinements.

Failures involved an 18- or 20in. bull gear and a 5-in. pinion in
the final drive of the tank. They
are highly stressed carburized
parts and original specifications
called for SAE 4620 (1.83 pct nickel) or SAE 4820 (3.50 pct nickel).
Critically short nickel supply
caused a shift to SAE 8620 (0.55
pct nickel, 0.50 pct chromium).
First of these were produced more
than a year ago but many didn't
get field service until recently.

Ordnance sources indicate that lack of experience in heat treating the leaner alloy was probably the most important contributing factor. Failures involved all tank plants heat treating 8620 gears.

Inspectors accepted tanks knowing they contained some parts which may have been less than perfect, Ordnance said. This was in keeping with the policy—laid

down by former Chief of Staff Gen. J. Lawton Collins—of getting usable weapons to combat units. Designs were not to be changed but need for taking swiftest production methods was stressed.

Stopping assembly of the tanks at the Schenectady plant of American Locomotive Co. on Nov. 18 was first public notice of the trouble. Production of parts at Alco's Auburn, N. Y., plant continued uninterrupted but shipments were held up.

Detroit Arsenal then sent its top metallurgist east to see if the stoppage, which idled some 1400 workers, could be ended. Parts shipments from Auburn were resumed last week and assembly was set to be resumed at Schenectady last Monday, tank testing operations Tuesday. Latest reports had the heat treating problem licked but if this was not so, manufacturers would change back to SAE 4620 or 4820 steel.

Design Is Sound

Quantities of matched sets of better-quality gears have been sent to Europe, where the failures occurred. These will go into a "floating reserve" which will not be allowed to pile up at one depot. They are to be kept mobile so that tank repair units will have them.

It seems that past maintenance involving gear replacement has not been flawless either. It often consisted of replacing a single worn - out gear rather than a matched set. This meant the tank might soon be immobilized again when the non-replaced gear was no longer serviceable.

On the M-47 design, Ordnance says there's never been any question of its soundness. Pentagon believes the design was good and says that most M-47's are in operable shape, ready for action.

Turn Page

THINTERSTY UT WILLIAM THERES

SKILLS: Time Runs Out for Watchmakers

Labor Dept. warns defense-essential skilled manpower pool of watch industry is endangered... Competition rocks it... May not be able to meet demand of war—By A. K. Rannells.

Dept. of Labor warns that the skilled manpower pool furnished by the American watch and clock industry may be bled to such a point that it could not meet the brunt of full-war emergency.

American-made watches once held 40 pct of the home market but competition, primarily from the Swiss, has depressed their share to 26 pct and the downtrend has not been halted. Had it not been for defense contracts, ranks of U. S. watchmakers would have been decimated. But the long-term danger to the precision skills pool remains.

Turn to Watchmakers

If crisis came, mushrooming war plants would exact a large demand for precision skilled workers by the tens of thousands to make time fuzes and parts, gyroscopes and intricate components, pin lever devices, precision timing mechanisms, fine precision instruments and scores of classified products.

Should war come demand for these items would heighten greatly. It would be necessary to turn to those with long experience in watchmaking. But, as Labor Dept. points out, this crucial manpower pool is declining. Meanwhile, more scientific war techniques impose an increasing demand for precision instruments.

What Should be Done

The government has been aware of the watchmaker's importance to defense work. It has been stressed by the former Munitions Board, other security agencies. Late last year, the White House appointed a special interdepartmental committee to look into the situation again. With the help of Bureau of Labor Statistics a special analysis was made. It follows:

The watchmaking skills are essential to defense. Because long training is required to develop these skills, a sizable number of workers should be kept in production and new ones in training. Object: a reserve of skilled manpower for precision type work.

No immediate government action needed to be taken last year because the level of watchmaking and pin-lever employment was still sufficiently high. But the committee urged that the matter be kept under continuing review. Labor Dept. believes that the time for another look is right now.

Diplomatic Impasse

The agency claims demand for American-made watches is declining, largely because of price competition from imports. Reciprocal trade agreements have kept protective tariffs low. Meantime, production costs for domestic producers rose and today it is estimated that a watch of less than 17 jewels (bulk of sales) can be imported and sold here at an average of \$4.50 less than its U. S. counterpart.

Something of a diplomatic impasse presents itself here. To raise tariffs on watch imports ostensibly

seems a simple safety measure to protect the home industry and simultaneously preserve the pool of skilled workers.

But a recommendation last year by the Tariff Commission to increase the import duty on watches was turned down by the White House. Considering that the Swiss furnish us a substantial market for other manufactured goods, it will be difficult to raise tariffs on one of their most important exports. And because the present Administration has postponed tariff action this year pending a special study, tariff relief for the watch industry is still doubtful.

Defense Order Crutch

Saving feature so far for pin lever and watch factories has been their ability to offset reductions in workforce by turning to defense contracts. About 30 pct of the workers in jeweled watch factories were turning out varied defense items in 1952. For 1953, defense orders have added slightly to employment

But the Labor Dept.'s experts warn that any tapering off of defense work would spell curtailed domestic watch factory output while imports remain unscathed. Result may be layoffs for our skilled watchmakers.

Several steps were outlined by the President's special committee for maintaining skilled watchmaking manpower levels should the situation warrant. These included: (1) Restoration of previous tariff rates, (2) imposition of import quotas, (3) removal of the 20 pct excise tax on watches, and (4) stockpiling of timepieces by the military.

EXECUTIVES ONLY SHOP PARKING THE RELEASE OF THE PARKING

-Special Report-

Continued

They're getting almost constant use in Europe, running up a lot of mileage on varied terrain as part of the program in that theater of keeping men and equipment in the field the bulk of the time.

Just how long the M-47s were in action before final drive failures

were noted hasn't been ascertained.

The M-47 is considered obsolescent and will be replaced by the newer M-48 shown in photo. Pentagon announced last May 21 that the M-48 was ready to go to tank units. But if replacement followed the usual pattern, it would be slow.

STEEL: Geneva Is Backbone of West

With output topping 100 pct of capacity, U. S. Steel's Geneva works is defying predictions that it would be no bargain . . . Plates top demand list—By T. M. Rohan.

The Geneva, Utah, mill of U. S. Steel Corp., not considered much of a war surplus bargain, even at 20 pct of its original cost, is currently going full blast to keep up with demand. Since acquisition from the Defense Plants Corp. by open bid it has become a backbone of western steel production turning out almost 30 pct of steel in 11 western states.

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Estimated output this year will to 1,850,000 tons, well over rated capacity of 1.67 million tons—highest in the West and percentagewise among the highest in the U.S. The major output of plates, originally intended for wartime West Coast shipbuilding is still under strict allocation and trails far behind demand.

Plates Very Tight

Since the war a substantial plate fabrication industry for storage tanks, pressure vessels, penstocks, bridges and buildings has sprung up in Salt Lake City. Major inentive is proximity to the plant and equidistant freight to Los Angeles, San Francisco, Portland and Seattle. Within the area plates still outsell structurals, the second tonnage item, 3 to 1. Geneva products average 85 pct of local sales to 15 pct midwestern and eastern imports, principally pipe and wire.

The plate shortage in the area is one of the tightest anywhere. Firms like Structural Steel and Forge Co. are working at only a fraction of their maximum capacity, limiting factor being plate supply. Sales effort by fabricators must be dampened because delivery promises are wholly predicated on plate allocations.

Large diameter hot-rolled coils go to the Pittsburg, Calif., mill for sheets and tinplate. Early this year a sheet mill was started up for production of hot-rolled sheets from some of the coils produced.

Capacity of the plant was jumped from the original designed 1,283,-000 tons to 1,400,000 in 1951 and 1,440,000 in 1952 through improved operating practices during the regime of Dr. Walther Mathesius, one-time U. S. Steel operations vice-president, one of the original proponents of a western plant in the 1930's, who retired 2 years ago after running it from its inception.

In 1952 a tenth openhearth boosted capacity to 1,600,000 tons. This year additional charging cars, crane capacity, and other "hardware" plus importation of better quality Oklahoma coking coal at \$6.50 per ton freight premium have brought capacity still higher.

Oklahoma coal is blended in substantial quantity with the high volatile Utah product for higher physical strength coke. Raw materials stocking facilities were also improved and new ore crushing and screening equipment installed. Charging box buggies, ingot buggies and two additional soaking pits also helped.

But L. J. Westhaver, vice-president and manager of Utah Operations, lays heavy emphasis on another factor. "The wage earner group in Utah scholastically rates considerably higher than most other steelmaking areas," he said. "With qualified direction from supervisors experienced elsewhere these people have assimilated experience and translated it into production much more rapidly and ably than most other groups. Utah ranks No. 1 among states in percentage of high school and college graduates and it has paid us major dividends on good plant relations and production."

Sales outlook for the Salt Lake area remains currently very bright. On the major plate market sales vice-president L. S. Brock expects to fill first quarter books without much trouble. Local fabricators



such as Commercial Shearing and Stamping Co., Chicago Bridge and Iron, General American Tank Transportation and Hammond Iron Works have heavy order backlogs for tanks and other structures made from plates rolled at the Ceneva mill.

These are formed and fitted locally, then sent to jobs all over the West from the Salt Lake transportation hub. Pipeline construction also offers a major plate market with frequent big jobs representing substantial tonnages.

Only area producer turning out reinforcing bars and smaller structurals is Colorado Fuel & Iron Works at Pueblo, 500 miles east. But the host of West Coast re-bar mills are currently swallowing 72¢ and \$1.12 per 100 lb freight bills to get business in the area.

Steel Firms Get Tax Writeoffs

The nation's two largest steel companies, United States Steel Corp. and Bethlehem Steel Co., both received certificates of necessity for further expansion from Office of Defense Mobilization recently.

U. S. Steel's Central Operations
Div. was granted a \$17,740,000
certificate with 50 pct allowed for
fast tax writeoff for expansion of
grain oriented silicon steel sheet
capacity at Vandergrift, Pa.

Bethlehem's certificate was for \$10,140,000 with 40 pct allowed for expansion of electrolytic tinplate capacity at Sparrows Point.



RED CHINA'S STEEL CITY of Anshan, center of a major industrial modernization project.

Inside Red China's Steel City

Focal point of the heavily Soviet-sponsored industrial buildup of Red China is the steel city of Anshan in Manchuria. Long ranked among the world's well known iron and steel works, Anshan has been the center of an intensive expansion program during the last 4 years.

Goal of the Chinese government is to establish a modern iron and steel combine at Anshan that will serve as model for industrialization of the rest of Red China.

Anshan will also be used as a technical training center to provide workers for other Chinese centers of heavy manufacturing.

IRON AGE correspondents have learned that Red China, aided by Russian blueprints, technicians, machinery (THE IRON AGE, Nov. 26, 1953, p. 49), has been highly successful in modernizing the Anshan facilities.

Major progress so far has been completion of a seamless tube mill and installation of the country's first mechanized blast furnace. As is true of other Anshan projects, technical standards are reported to be "among the highest known in the world."

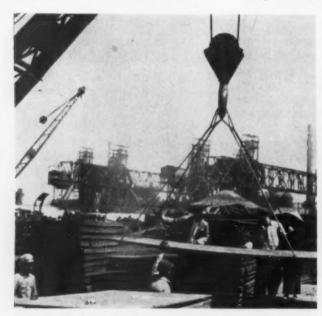
At present Anshan plants stretch



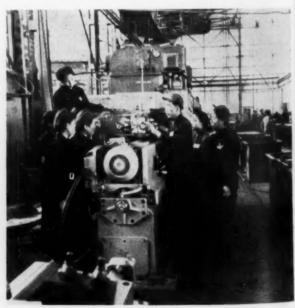
FIRST WOMAN blast furnace boss, Wu Yuan-yu, is in charge of No. 1 blast furnace at the Anshan iron and steel plant.

for more than 5 miles along the Chanchun Ry., and more than half of the steel city's population is employed in these plants. But by the end of China's first 5-year plan (1957), the Anshan plant is expected to be three or four times its present size.

Latest report is that 10,000-ton rolling machines have recently been installed in Anshan's new heavy rolling mill, which is a copy of the most modern Soviet mills and is equipped with Russian machinery, technicians.



STEEL SHEET for construction of rolling mill at Anshan. New mill's capacity will be four times that of the one it replaces.



SOVIET-TRAINED technician demonstrates machine operation to women workers at Anshan's new seamless steel tube plant.





RUSSIAN EXPERTS and Chinese workers watch first heat from Anshan's No. 8 blast furnace. Recently completed, this unit is Red China's first mechanized blast furnace. Another is currently under construction.

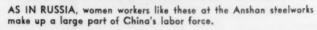
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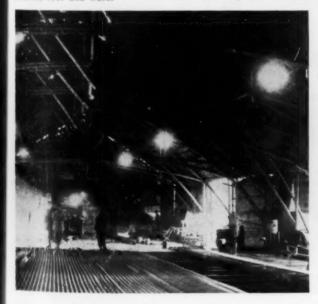
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ANGLES for building construction are cooled at the No. 2 factory of the Shanghai Steel Co. Note bamboo ceiling supports, thatched roof and walls.



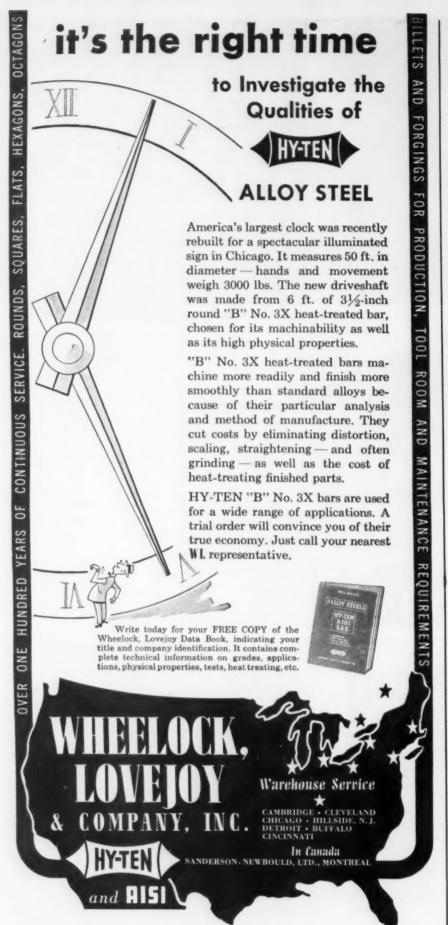






December 3, 1953

AGE



126 Sidney St., Cambridge 39, Mass.

and Cleveland • Chicago • Detroit Billside, N. j. • Bullalo • Cincinnati **Expansion**

Iron Powder:

Republic starts work on new 25-ton-per-day plant.

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Republic Steel Corp. has officially started construction of a \$2,200,000 plant which may some day lead to mill tonnages of steel directly reduced from iron ore.

Complete elimination of blast furnaces and openhearths is still a vision. But Republic has taken the first step in Toledo by breaking ground for a powdered iron plant which will swing into production next summer.

As the first major steel producer to enter the field (see The Iron Age, July 2, p. 74), Republic anticipates daily production of 50,000 lb of iron powder, an output which will represent a substantial part of total industry output.

Powder Market Grows

Republic's Steel and Tubes Div. will operate the plant. It will employ about 100 persons earning an estimated \$500,000 annually. Toledo site was chosen because it is ideally situated to supply the automotive industry, currently the primary user of powdered iron. Availability of waste hydrogen was also considered in addition to nearness of water transportation on the Great Lakes.

Market for precision mechanical and structural parts fabricated from powder is not limited to the automotive industry. Authorities estimate that there are more than 100 firms using powder.

Within the past 5 years consumption of iron powder has more than doubled. In 1948 it was about 4900 tons. This year it is estimated that 12,000 tons will be consumed.

U. S. Steel Builds Container Plant

U. S. Steel Products Div. plans to start construction of a steel container plant in Pennsauken Township, Camden, N. J. The new plant, designed for production of steel drums and pails for petroleum, chemical, paint, food and other industries, will have 168,000 sq ft of floor space.

FARM MACHINES: Keep Up '53 Pace?

Farm equipment salesmen mildly optimistic about market in '54... Believe it may equal '53 pace... But cautious purchasing agents cut steel orders—By K. W. Bennett.

Weather and prices permitting, the outlook for farm equipment sales during 1954 is mildly optimistic. That's the forecast of farm equipment salesmen who attended the Farm Equipment Institute meeting in Chicago last week.

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To support this belief they point out that farm savings accounts are high, that the drought in the South and Southwest may be breaking, that dealer inventories have begun to thin out again. Some believe sales in several areas will at least equal 1953 levels and may even exceed them in a few others such as the northern parts of the Midwest.

PA's Not So Eager

Farm debts are at a reasonable limit. And though farm prices are 20 pct below the peak of February. 1951, over half of the decrease was in the first 6 months of 1953. There

are indications that some prices may start creeping up again.

But while farm equipment salesmen are hopeful, purchasing agents aren't quite so eager about next year's outlook. Last month these purchasing agents began their steel buying for the spring farm equipment market, and most say they are buying from 10 to 25 pct less steel this fall than they did last year at this time.

Reason for this is their strong raw materials inventory position, and confidence that they can get steel 3 to 6 weeks after placing their orders.

Several purchasing agents say they have actually been cutting raw material inventories during the fall months. Their heavy use items: bar, plate, alloy steel, semi-fabricated plate, sheet, along with some terneplate, seem to be at last ample.

Production

IRON & STEEL: October Output By Districts

As Reported to the American Iron and Steel Institute

BLAST		PIG	IRON	SPIF(BELA		TOTA	L		
FURNACE NET TONS							1	Pct of Capacity		
DISTRICTS	Annual Capacity	Oct.	Year to Date	Oct. Year to Date		Oct.	Year to Date	Oct.	Year to Date	
Eastern PittsYngstn CleveDetroit	16,312,990 28,643,120 8,633,800	1,311,268 2,296,363 696,628	12,281,899 22,882,959 7,066,130	25,974 34,198	278,244 345,949	1,337,242 2,339,561 696,628	12,560,143 23,228,908 7,066,130	98.5 95.8 95.0	92.4 97.4 98.3	
Chicago Southern Western	16,251,250 6,020,380 3,518,700	1,306,980 474,179 334,334	13,115,396 4,668,160 3,260,535	11,071 6,715	22,528 79,519	1,318,051 480,894 334,334	13,137,924 4,747,679 3,260,535	95.5 94.0 111.8	97.1 94.7 111.2	
TOTAL	79,380,240	6,419,752	63,275,079	77,958	726,240	6,497,710	64,001,319	96.3	96.8	

			TOTAL ST	EEL.		ALLOY	STEEL	HOT TOPPED CARBON INGOTS		
NET TONS				Pct of	Capacity	İ				
DISTRICTS	Annual Capacity	Oct.	Year to Date	Oct. Year to Date		Oct.	Year to Date	Oct.	Year to Date	
Eastern PittsYngstn. CleveDetroit Chicago Southern Western	23,863,810 43,621,000 12,002,900 24,960,600 6,036,160 7,063,000	2,016,599 3,416,002 947,322 2,029,365 507,604 545,830	19,024,220 35,247,457 9,489,549 20,633,619 4,850,047 5,728,447	99.5 92.2 92.9 95.7 99.0 91.0	95.7 97.0 94.9 99.2 96.5 97.4	97,008 403,654 52,624 97,813 3,178 8,503	1,521,931 5,210,956 782,300 1,432,771 47,088 112,433	362,903 402,470 65,537 273,136 8,425 23,521	837,75 3,160,19	
TOTAL	117,547,470	9,462,722	94,973,339	94.7	97.0	662,780	9,107,479	1,135,992	12,541,44	

^{*} Includes Alloy Steel, Hot Topped Carbon Ingots.

Gets Large Farm Order

Minneapolis-Moline Co. recently received a \$250,000 order for farm machinery from Garcia Cadena & Caceres, Ltd., Bogota, Colombia.

The order called for immediate shipment of \$170,000 worth of farm equipment, including four and five-plow diesel tractors, four-plow distillate tractors, two-plow gasoline tractors and a complete set of plows harrows, planters, and cultivators for each tractor.

Automotive demand for bar could blot out some of the available bar mill space, but farm equipment purchasing men are confident they can get all the hot-rolled and cold-finished bar they will need. Inventories are generally at the old 45-60 day level, some have cut below this.

Keyed to Caution

The effect of this buying policy is already apparent. Bar sales and foundry sales in the Midwest generally stir in the fall as the farm equipment buying steps up. This year they oozed up slightly during October then fell off somewhat and apparently aren't going to get much better during the rest of '53.

PA's watchword is caution. Ordering will be on a 30-day basis. Buying will generally be done in the manufacturer's home area. If a purchasing agent has to buy raw materials from outside, he is confident that he can get the material at a price competitive with local sources.

See Slight Sales Drop

Though raw material buying will be as much as 25 pct below purchases made this time last year, purchasing agents do not expect farm equipment sales to drop much more than 10 pct from 1953.

Estimates vary, however. In one case the selling force made a prospective market round-up, decided sales in '54 would be above the 1953 level. Nonetheless, the home office, despite the survey, expects plant sales to run 7 to 10 pct below this year. Raw material purchases have been pegged accordingly.

THINYTHSITY OF WILLIAM TIKHAKIFS

METALS: Military Wants Birthmarks

Government explores chances for a military standard for birthmarking steel . . . Decision unlikely soon . . . Extra cost scares many firms . . . What are obstacles—By J. B. Delaney.

A government-proposed military standard for birthmarking steel and other metals is making the rounds of industry. Producers and fabricators are being asked whether the proposed standard would be satisfactory and whether they favor its adoption.

What Are Obstacles?

The question is one that has been kicked around for several years, and the current survey is yielding so many diverse opinions that a definite conclusion one way or the other is not likely in the near future.

If a standard is finally adopted it will probably be on a limited basis at the outset, and not as all-inclusive as the government proposal would represent.

Steel producers, while not opposed

to adoption of a standard as such, raise some questions, including:

(1) Is the proposed standard necessary or practical?

(2) If so, should all steel consumers be saddled with the added cost of marking the steel when most of them find existing identification methods adequate? In other words, should the good housekeepers among consumers be penalized for convenience of the few careless housekeepers?

(3) The government proposal would involve installation of new equipment for marking steel. In some plants it would mean construction of new buildings, particularly in older mills that already are cramped for space. Even if machines for continuous marking are available, production is bound to be

slowed. Before hot-rolled steel could be properly marked, it would have to be descaled and pickled and probably re-oiled after marking.

(4) Will consumers be willing to pay for these extra operations? No one knows exactly how much additional cost will result. But it could run high in relation to overall cost of the metal, except in the case of some costly specialty steels and alloys for which mills already take special precautions to prevent loss of identification.

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(5) Most consumers, particularly the larger ones, already have their own systems for avoiding steel mixups. The small tonnage that somehow loses its identification is salvaged through chemical analysis and other methods. Chances are these companies would retain their present systems and face additional costs for the proposed marking standard. Defense requirements account for only a small part of total steel shipments and only a fraction of defense shipments go directly to government agencies. The lion's share of these are processed by private industry.

Steel consumers likewise tend to be lukewarm toward the proposal because of additional cost.

Offset Extra Cost

Government proponents of the proposed standard recognize some of these objections as valid but they still contend the proposal has merit. They admit the system might have to be restricted to be practical, that it would not be necessary to continuously identify some steel products. They also say their main objective is to work out a system that could be tied in with regular commercial practices.

The government surveyors point out that the proposed standard might offset additional cost through reduction of the number of analyses necessary to insure proper identification under the present system and through simplifying the consumer's problem of avoiding metal mixups.

The Office of the Assistant Secretary of Defense, which is making the survey, reports it is "pleased" with the response from some 300 to 400 steel consumers circularized.

Metal Marking Proposals

Government metal marking proposals, if adopted, would require that mill name or trademark, commercial designation or specification, heat number (on ferrous metals), and certain other information be shown as follows:

Item

Application

Bars

Printed on all bars ½ in. or more in width of flat and ½ in. or more in diameter in constantly recurring symbols at intervals not greater than 3 ft throughout length of bar All smaller sizes bundled and tagged at each end-A third tag placed near middle on inside of bundles

Castings ingots, Pigs, Slabs and Billets Cast integral with, stamped, or otherwise permanentlymarked on each casting, ingot, pig, slab or billet.

Extrusions and Shaped Tubing

Printed on all extrusions and shaped tubing in constantly recurring symbols at intervals not greater than 3 ft throughout length of extrusion or shaped tubing. All sizes too small for marking bundled and tagged at each end. A third tag placed near middle on inside.

Plates, Sheets, Strips and Flat Products

Printed on all plates, sheets, strips and flat products in rows of constantly recurring symbols from one edge to opposite edge, so that no piece larger than 12 in. square could be cut without bearing the information. Thickness in inches to be included.

Structural Shapes

Printed near end of each structural shape.

Tubular Products, Coiled Tubing Printed on all tubular products ½ in. or more in outside diameter in constantly recurring symbols at intervals not greater than 3 ft throughout length of product. All smaller sizes bundled and tagged at each end. A third tag placed near middle on inside of bundle. Wall thickness and OD in inches to be included.

Wire

Each spool marked on the ends and each coil or bundle of straightened and cut wire shall be tagged. Diameter in inches also to be included. could

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STEEL: Quote Delivered Base Prices

Republic Steel to start new method for quoting delivered base prices for hot-rolled carbon bars . . . "County symbol" system eases freight cost figuring—By R. M. Lorz.

Republic Steel Corp. will soon introduce a new method for quoting delivered base prices on hot rolled carbon bars. The Ohio firm's "county symbol" method probably won't cause any quick revolution but it should relieve consumers of the irritating job of computing complex transportation costs.

System will go into effect Dec. 15, for the time being will be applied only to hot-rolled bars. Here is how it works:

Symbols Give Costs

New mill prices for hot rolled bars will be established at Chicago, Cleveland, Youngstown, Buffalo and Gadsden, Ala. Combining mill prices and most economical cost of transporting minimum rail and truck shipments, Republic's sales department has come up with a total delivered cost for each of 1481 counties it normally serves. Company stands ready to furnish quotations for any other county in the U. S. upon request.

Since Republic produces hot rolled bars at five different locations a system of county symbols has been published to enable consumers to tell at a glance which mill quotes the lowest delivered price in their area.

County symbols are merely a combination of alphabetical and numerical keys to delivered cost from producing points to any county in the country. Alphabetical symbols represent cities—C, Ch for Cleveland, Chicago, etc. Numercial symbols running from 1 through 39 stand for delivered costs arranged in progressive order dictated generally by distance and regional shipping costs.

Price Picks Mill

Although Republic reserves the right to stipulate method of shipment, consumer has the option of selecting his own form of transportation at additional cost. Con-

sumers in switching areas adjacent to mills have the option of free delivery or can come into the mill and pick up steel themselves.

Consumers in counties outside switching areas will consult county symbol sheets showing cost of delivering hot-rolled bars from all producing mills situated within practical distance of consumers.

For example, a consumer at any common carrier destination in Franklin County, Ohio, will pay \$4.41 per 100 lb for bars produced at Cleveland; \$4.46 for Youngstown bars; \$4.56 for Chicago bars and \$4.62 for bars produced at Buffalo. If Cleveland were a producing point for the particular size and quality desired consumer would naturally place his order at that mill. On his Ohio county symbol sheet the Franklin County customer would find this legend:

 County
 County Symbol

 B
 CH
 C
 Y

 Franklin
 8
 7
 4 C .035
 5 C .03

By consulting a master county

symbol list the customer would find delivered cost on 80,000-lb rail shipment from each mill. Ohio county symbol sheet contains listing of additional charges for 32,000-lb minimum truck shipment if desired. Under "C" the county symbol 4 indicates a delivered cost of \$4.41 per hundred lb for a minimum shipment of 80,000 lb from Cleveland. Letter "C" in parentheses followed by figure .035 indicates to consumer that truck shipment would cost an additional $3\frac{1}{2}$ ¢ per 100 lb.

Republic officials emphasize the new method has no connection with freight absorption. It was undertaken before absorption became a factor in steel. Pricewise local competition and freight absorption will still be settled on a day-to-day basis.

Prospective consumers wondering about overall cost can put their minds at ease. New pricing method will not cause any significant change according to Republic Vice-President Norman W. Foy. He says consumers in some areas will pay a little more for bars while others will pay less.

While Republic officials admit bar pricing under the new method will serve as the guinea pig they are confident system will prove itself and be extended to most of the firm's products.

Advantages of Delivered Prices:

To The Customer

(1) Delivered base price is instantly available to the customer f r o m published material without necessity of computing transportation charges.

(2) Customer can determine from published information what products, sizes, etc., at what price are produced at each of several mills.

(3) Customer avoids all bookkeeping on transportation charges. He has no freight damage claims to prosecute, no transportation to arrange.

To The Producer

- Salesman can make delivered price quotations to the customer from information that he carries with him.
- (2) Sales and traffic departments avoid numerous calculations from complex rail and truck freight rate structures for each order.
- (3) Clerical work in the sales, traffic and accounting departments is substantially reduced.



Materials analysis by X-Ray fluorescence is the newest industrial tool. The new ARL X-Ray Quantometer* gives you a fast, accurate, non-destructive technique for quantitative determinations of elements present in materials regardless if they are free or in combination. This multichannel unit can be supplied with interchangeable dispersive and non-dispersive analyzers in any combination. As many as eight channels can be used simultaneously... giving EIGHT TIMES the analytical speed previously obtainable! The results are graphed for you automatically in multiple to provide a permanent record.

For years, Applied Research Laboratories have provided industry with most of its direct-reading instruments for emission spectroscopy. This vast experience has been combined to give you in the XRQ the finest analytical instrument available which can be readily adapted to either laboratory or production control problems. ARL field engineers will be happy to demonstrate the money-saving possibilities of the XRQ in your business. Write today for complete catalog information.

The ARL line includes Production Control Quantometers, Industrial Research Quantometers, 1.5 and 2-meter Spectrographs, Precision Source Units, Raman Spectrographs and related accessories.



-Purchasing

ECONOMY: The Slow Slice

Purchasing agents say business is still slumping . . . But activ. ity is still better than norm.

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Purchasing agents with close view of economic trends all over the country spotted a continued weakening of industrial business during November. In its monthly analysis of the nation's economy National Assn. of Purchasing Agents says that while its November report is not overly encouraging, business is still good compared to any normal period.

Employment Slips

New orders were reported down again, but the drop was less than in October. Production dipped for the second consecutive month, increasing the tendency to narrow the gap between declining orders and output, a good sign.

Prices remained fairly static, with some soft spots showing through. Industrial inventories of raw materials are still on the decline, with postponement of scheduled fourth quarter commitments to first quarter becoming more frequent. Few cancellations were reported, however.

Employment, both by number and hours worked, is off for the third successive month, but few reductions in the labor force were severe. Buying policy is conservative, running 60 days or less.

Competition Stiffens

Purchasing agents expect these down trends to continue for the rest of this year, but point out there has been no sharp drop and none is anticipated.

Competition is reported to be very keen, with much market testing being done to find a buying level. There are more reports of price protection and consignment arrangements as manufacturers try to move inventories and retain customers.

Purchasing agents believe industrial goods will tend to soften item by item, as stiff competition forces closer attention to costs and production efficiency.

Slow Slide Continues

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Unworked stocks again showed a decline during November. Cut-backs are resulting from the runout of seasonal goods and preparations for year-end inventory taking. Few cancellations are mentioned, but deferment of fourth quarter shipments to January and February may have a depressing effect on new orders during the first quarter.

Number of firms reporting layoffs and shorter workweeks outstripped those increasing employment by 4 to 1. Overall, the employment indicates a selective
policy, with the less efficient workers laid off, overtime being cut,
alternate shifts being used to
spread the work.

Canada Follows U. S.

Of particular interest on buying policy are indications that there may be fewer annual requirement contracts. This type of arrangement was used widely during the past few years of materials shortages.

Canadian reports for November indicate a slowup in production, though not as marked as in the U.S. Commodity prices show more strength, inventories are higher, employment lower. Buying policy is on a longer range basis. Order position is better than in the States.

Generally, business in Canada is at high rate, but is beginning to follow the tapering pattern set in the U.S. European competition is said to be stiffer.



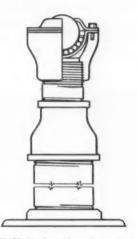
Logan Ball Transfer units consist of a large steel ball which rotates on a bed of small balls contained in a bardened steel cup.

BALL TRANSFERS

Logan Ball Transfers are handling equipment, designed primarily for use in transferring at right angles or where it is desired to rotate packages without lifting. Can be adapted to other applications. You can buy separate ball assemblies from stock or complete tables made-to-order.

Logan offers Ball Transfer units in several different sizes.

Further information on request.



Ball Pedestal units also available for handling sheets and plates.



Logan Conveyors

LOGAN CO., 545 CABEL ST., LOUISVILLE, KY.

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AIR COOLERS: Southwest Sales Thrive

Low cost evaporator units are \$50 million industry . . . Account for 90 pct of Arizona coated sheet sales . . . Dry climate necessary . . . Export sales grow—By T. M. Rohan.

When Grandma wanted to cool off the house on a hot summer day she set a tub of water in front of an open window or electric fan. The Southwest has adopted this practice but has given it a new twist.

A \$50-million metalworking industry producing evaporating air coolers has grown up. The industry is confined almost exclusively to Phoenix and Los Angeles, as a very dry climate is needed to provide sufficient evaporation. Since beginning of regular commercial production around 1938, growth of the low cost home cooler market has been phenomenal.

Sales Over \$4 Million

One of the leading firms, International Metal Products of Phoenix, started in 1946 from a sheet metal shop. Since then annual sales each year have equalled sales of the 2 preceding years with the lone exception of 1949. The firm currently

is in the throes of a \$250,000 expansion to boost output 35 pct with two new presses and added plant area which will extend four city blocks.

Export Market Grows

Sales for 1953 were over \$4 million and for 1955 are expected to top \$5 million. Mass production and improvements have dropped manufactured price of \$285 for original handmade models to \$125.

International and two firms in Phoenix, Palmer Mfg. Co. and Wright Mfg., already account for 90 pct of coated sheet sales in Arizona. This represents almost 15 pct of the average annual steel sales of 100,000 tons in the state.

The Phoenix group and Thermador, Rheem, Tradewinds, Essick and Utility Plants Corp. in Los Angeles turn out about 80 pct of the nation's evaporative coolers. Nationally the 1953 market will hit about 500,000 units conservatively

valued at \$30 million at the manufacturers' level, compared to a 1952 market of about 400,000 units.

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Sales were originally confined to Texas, Arizona and California. In the last few years, however, some inroads have been made north into Montana and Wyoming, the Midwest and East. A healthy export business is also building up for Mexico, Iraq, Iran, Palestine, Algiers, Morocco and Egypt. Only foreign modification is special 50 or occasional 25 cycle motors for local electrical supply. Currency conversion problems, however, have slowed export market growth.

Have Biblical Precedent

President Adam Goettl of International calls the coolers "dollar for dollar, one of the greatest boons to human comfort ever developed," and says the surface of the market has been only scratched.

Major advantage is cheapness and simplicity of installation and operation. Units are based on the age-old principle of the cooling effect of an evaporating liquid. The Near East has used skin water bags for this since Biblical times. Modern version is a roof-mounted square box with vented sides containing water-soaken excelsior.

Range Is Limited

Fresh air is drawn through the sides, cooled, and discharged through the home. Single room sizes are also made for window mounting, selling for down to \$29.95. Air is drawn in by a squirrel-cage type vaned fan, belt-driven by a 1/3 hp motor in the home size.

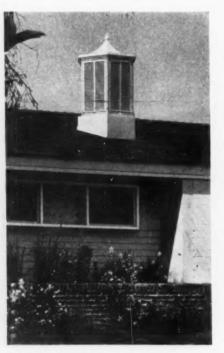
An average home unit retails for about \$300 installed, including ductwork, compared to anywhere from \$850 to \$3000 for refrigerated air conditioning. Evaporator units do not have nearly the range of refrigerator types, but an average home cooler will drop the temperature about 20° depending on temperature, humidity and other factors.

Drawing Big Problem

About 40 pct are sold through sheet metal shops with remaining sales almost equally shared by appliance and furniture shops, spe-



ASSEMBLY of evaporator in Phoenix plant of International Metal Products.



TYPICAL installation of evaporating air cooler in Southwest.

-Management

cialty dealers, mail order houses and auto accessory stores. Currently, homes represent 75 pct of the market and office and industrial plants about 25 pct.

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Manufacturing is seasonal with some stockpiling of parts during summer for start of heavy 6-month runs beginning about November. Basically, the units consist of four double-walled sides either spotwelded or screwed together and packed with excelsior. A small water tube over each drips water down continuously, can be used to regulate cooling effect to some measure. Mounted inside are the squirrel cage fan, motor and drive.

Mechanical toggle-type presses up to 400 tons capacity for a fast draw are used together with spot welding and other assembly line facilities. Knottiest production problem is getting a satisfactory draw with coated steel stock. In forming round cornered tops and bottoms, coating often separates from the base either during draw or overnight. Joint research with steel suppliers and use of 1-oz-per-sq-ft continuous hot dip sheets have largely minimized the problem in recent months.

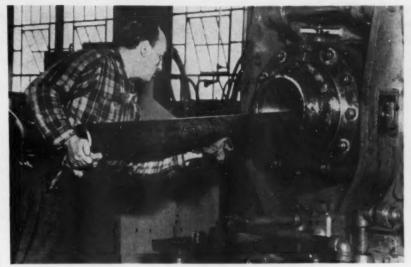
Gulfport Development Plan Wins

Chalk up another marker for local industrial development programs. As a result of efforts by citizens of Gulfport, Miss., to attract new industry, Mississippi Aluminum Corp. will operate an aluminum extrusion plant in the area.

The company is operating in a temporary plant until February, when construction of its new \$550,000 facilities, paid for by a bond issue floated by the City of Gulfport, will be completed.

Mississippi Aluminum is turning out various types of aluminum extrusions and will concentrate on irrigation and refrigeration tubing.

Main factors that influenced the company in picking Gulfport for its new plant were availability of skilled labor, nearness to ingot supplies at the Kaiser Aluminum plant in New Orleans, shipping facilities offered by Gulfport.



HOT FORMING operation at Tube Reducing Corp. Before this, tube is cold-formed by Rockrite process under the same roof.

Merger: Better Service

A plan to merge American Products Co., Detroit, and Tube Reducing Corp., Wallington, N. J., should greatly increase their efficiency in serving their customers.

Main advantages of proposed merger appear to be (1) quicker delivery of customers' orders, (2) substantial freight savings on raw materials and finished products, and (3) manufacturing economies.

Merger on a stock-for-stock basis has already been approved by boards of directors of the two firms. Resulting corporation, American Metal Products Co., would continue to operate both businesses with separate corporate identities and no change in present managements. Proposal is still subject to approval of stockholders of both companies at meetings to be held within 60 days.

Would Expand Production

American Metal Products Co. manufactures electric welded tubing for use in fabricating auto seat-frame assemblies, axle housings, and similar products. Tube Reducing Corp. produces close-tolerance, compression-sized seamless tubing for a wide variety of end uses.

Thus, both companies have closely related engineering and manufacturing interests which are noncompetitive and complementary.

Merger plans include dual expansion of manufacturing at each plant to meet expanding markets for products of both companies in both areas. American Metal Products Co. can render better service to its eastern customers with a New Jersey production facility. And Tube Reducing Corp. can improve its customer service by producing seamless tubing in Detroit.

An extension of this plan of locally-produced products is contemplated by managements of the two firms. Although no specific arrangements have been made, a combined facility on the West Coast is being given active consideration.

Combined sales of the two firms this year are estimated to be more than \$45 million.

SPENDING: Downtrend to Come Slowly

Defense procurement decline will take time to show up despite expected budget cuts... Wide gap between orders and payment... Hope for carryovers—By A. K. Rannells.

Course of defense spending seems pretty well charted through next June, but on higher orders close-mouthed Pentagon officials still refuse to comment on the probable direction the spending curve will take after that date.

Chances are that the expected downtrend may be so slow as to be virtually unnoticed for some time, even though next year's budget should end up by being trimmed sharply.

\$44 Billion On Order

Chief reason is that there's a lot of grass growing between obligations and contracts and the actual spending which, for the

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most part, doesn't take place until delivery. This spread for heavy goods ranges up to as much as 4 years in certain aircraft buying.

As it stands, the Defense Dept. had roughly about \$44 billion worth of major hard goods on order at the start of November—aircraft, ships, tanks, motor vehicles, ammunition, spare parts, and so on.

There was still something like \$16 billion in the defense checking account for obligation for hard goods procurement over a 9-month period.

These figures include neither foreign military aid nor construction and public works under jurisdiction of the military. Add an additional \$6 billion for these.

It is no secret that the Defense Dept. would be happy if actual expenditure can be held to around \$40 billion during the current fiscal year, although most expect it to run around \$42 billion-plus.

This would mean a considerable carryover in major hard goods procurement for later production and delivery, even without a dime in new money appropriations.

Where It Goes

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By far the largest portion of planned expenditures for last quarter 1953 and first half 1954 is being channeled into aircraft—something like \$28.5 billion, give or take a few hundred million. About \$20 billion is on firm order.

Programmed ammunition expenditure was intended to run in the neighborhood of \$8 billion for the fiscal year. There are indications, however, that spending in this field will taper off beginning in early 1954.

Shipbuilding and harbor vessel contracts will involve obligation and expenditure of around \$3 billion. Tanks, other combat and support vehicles will tie up more than \$4 billion in appropriated and available funds.

Hold Artillery to \$1 Billion

Not so much money is being channeled into the guided missile program as might be thought. Very little is outstanding in unpaid obligations but well over \$1 billion is reserved.

Something like \$3 billion has been earmarked for production equipment and facilities. An equal amount is being or has been put into electronics and communications.

End of the shooting war has made it possible for the military to hold its planned expenditures for artillery and other weapons along these lines to \$1 billion through June.

Maintenance spares and spare parts still remain a big item. Allowance in this category this year runs more than \$2 billion.

STEEL: What Mills Shipped in September

As Reported to the American Iron and Steel Institute

		SEP	TEMBER	1			TO DATE	THIS Y	EAR	
STEEL					Pct of Total					Pct of Total
PRODUCTS			Stain-		Ship-			Stain-		Ship-
	Carbon	Alloy	less	Total	ments	Carbon	Allov	less	Total	ments
ingots	23.907	20,795	1.874	46,576	0.7	596,276	193,794	19.580	809.650	1.3
Blooms, slabs, billets, tube rounds, sheet	20,000		*10**	10,010	0	330,270	130,101	10,000	000,000	1.0
bars, etc	140,990	43,330	1,193	185.513	2.9	1,649,964	455,406	16,132	2,121,502	3.4
Skelp	8,295			8,295	0.1	80.834			80,834	0.1
Wire rods	63,876	1,650	447	65,973	1.0	638,617	16,358	5,310	660,285	1.1
Structural shapes	390.283	3.098	-1	393,380	6.1	3,605,361	49,219	270	3,655,850	5.8
Steel piling	25,142	8	***	25,150	0.4	238,294	14	2.0	238,308	0.4
Plates	552,671	31,761	2,062	586,494	9.2	5.433,101	322,966	23.910	5,779,977	9.3
Rails-standard	158,015		A. WOLL	158.015	2.5	1.356,449	64		1,356,513	2.2
Rails-all other	4,248			4.248	0.1	66,139	65		86,204	0.1
Joint bars	10.334			10.334	0.2	92,890				
Tie plates	35,260				0.5			* * * * * *	92,890	0.2
Track spikes				35,260		322,520			322,520	0.5
Track spikes	10,183			10,183	0.2	95,686			95,686	0.2
Wheels	29,695	59		29,754	0.5	255,138	681		255,819	0.4
Axles	11,605	30		11,635	0 2	125,777	510		128,287	0.2
Bars-hot rolled		163,350	3,228	723,219	11.3	5,427,167	1,883,543	35,603	7,346,313	11.5
Bars-reinforcing				163,223	2.5	1,423,615			1,423,615	2.3
Bars-cold finished		25,070	4.088	171,458	2.7	1,430,200	279.899	46,058	1,756,157	2.8
Tool steel	1,167	7,413	41	8.580	0.1	13,267	77.057		90,324	0.1
Standard pipe	228,984	16	1	229,001	3.6	°2,171,802	516	12	*2.172.330	3.1
Oil country goods	145,267	21,353		166,620	2.6	°1,292,846	180,557		*1,473,403	2.4
Line pipe	314.054	13		314.067	4.9	°2,672,973	407		*2.673,380	4.3
Mechanical tubing	66,004	22,564	396	88.964	1.4	635,737	226,217	4.417	866,371	1.4
Pressure tubing	29,345	3,996	1,238	34,579	0.5	294,011	37,816	12,401	344,228	0.1
Wire-drawn	196,461	3.818	2.023	202,302	3.2	2.214,999	41,658	26.037	2.282.694	3.
Wire-nails, staples	46,624			46,624	0.7	412,800		5	412,805	0.
Wire-barbed, twisted	14,724			14,724	0.2	139,919		1	139,920	0.
Wire-woven fence	17.033			17.033	0.2	212,119				
Wire-bale ties	2,505			2.505					212,119	0.
Blackplate.	80,805				0.0	32,502			32,502	0.
Tin & terneplate-				60,805	0.9	586,975			586,975	
hot dipped	95,060			95,060	1.5	1,046,159			1,046,159	
Tin plate-electrolytic.			4.000	244,718	3.8	2,685,141		200	2,685,141	
Sheets-hot rolled	604,693	24,916	1,212	630,821	9.9	*5,686,259	*282,711	*12,711	*5,961,681	
Sheets-cold rolled		9,940	8,922		14.5	°8,272,257	°108,011	*96,465	*8,476,733	
Sheets-galvanized.	194,257			194,257	3.0	1,729,386	11		1,729,397	
Sheets-other coated.				23,628	0.4	204,230			204,230	
Sheets-enameling	21,233			21,233	0.3	176,421			176,421	
Electrical sheets, strip				67,977	1.1	108,272	527,223		635,495	
Strip-hot rolled		3,368	511	191,598	3.0	1,732,460	38.821	*3,229	*1.774.510	
Strip -cold rolled						*1,468,065	16,763		*1,663,096	
TOTAL	5,908,839	444,671	47,247	6,400,757	100.0	*56,627,648	4,740,287	*480,389	*61,848,324	100.

During 1952 the companies included above represented 98.5 pct of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.

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Frauenthal Grinders assure precision to MILLIONTHS of an inch

HOW? By use of KAYDON heavy-duty super-precision, pre-loaded bearings.

WHERE? In the table-spindles of Frauenthal Double-Head super-precision cylindrical grinders . . . table-sizes ranging from 30 inches to 140 inches.

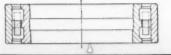
WHAT? Two oversize, super-precision bearings. one is a double-row tapered roller bearing at top of table-spindle... the other is a double-row straight roller bearing at bottom of table-spindle... both preloaded and designed to allow for thermal changes without affecting upper bearing.

Precision-Proven for over a decade

For over 10 years Frauenthal Grinders have been performance-proved on precision grinding of parts for aircraft, jet and automotive engines, tanks, gun mounts, radar units, Diesel parts, valves, large precision bearings and other precision parts and assemblies.

Cross section of both bearings





Valuable grinding,

Frauenthal MULTIPLE-HEAD Grinders CYLINDRIGAL Grinders

PRECISION-GRIND INSIDE, OUTSIDE AND FACES
SIMULTANEOUSLY TO MILLIONTHS OF AN INCH!

Let's discuss your grinding problems

With these modern grinders, you can make many combinations of grinding-spindle positions for a wide variety of simultaneous grindings of outside and inside diameters or faces, to extremely close tolerance of ,000200" (200-millionths of an inch) or better. Valuable grinding, boring, turning details on request.

In 10 standard sizes, conforming to J.I.C. specifications

	5	ieries	1800	0	Series	2000	Series 2200						
Table sizes	30"	36"	42"	48"	60"	72"	110"	120"	130"	140"			
Maximum swing	60"	60"	60"	60"	72"	88"	120"	130"	140"	150"			

write for bulletin

Frauenthal Division

THE KAYDON ENGINEERING CORP.

-MUSKEGON, MICHIGAN-

• Save Time, Effort in Every Shop Operation with NEW . .

HANDBOOK OF STANDARD TIME DATA

-for Machine Shops

by ARTHUR A. HADDEN, late President, and VICTOR K. GENGER, Vice President, McClure, Hadden & Ortman, Inc., Management Engineers

NOW—for the first time — a one-volume source for all the tested, detailed standard data you need today for establishing machine shop time values. Here are separate tables for each common type of machine operation —lathe turning.

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milling, drilling, grinding, precision boring, broaching, boring mill operations, planes and shaper operations, punch-press operations, arc welding, gear-cutting, power sawing.

Type of Data Long Needed

The Handbook is unique in that it takes into account the actual conditions under which various operations are performed. In specifying time data for manual operations, it recognizes such variables as weight of piece, characteristics of destination, and type of transport. The recommendations for machining and the tables for machine elements take into account such factors as type of equipment, type of material, amount of material to be removed, tolerance to be held, finish required, and tool life.

Separate Time Studies No Longer Required

GIVES YOU standard time data from the research and practice of scores of leading American plants—which, when applied, can eliminate for you the problem of performance rating and the necessity of taking individual time studies whenever a standard is needed. The tables help you make accurate predictions of the time required to perform a contemplated job. They enable you to establish production standards directly from the blueprint.

When you set standards with these tables—the results of a great number of studies—rather than from scattered individual studies, you get greater accuracy, higher consistency, better coverage, and lower cost. In manufacturing, the tables will facilitate estimating for bids, quotations, subcontracting, standard costs, incentive plans, measured day work, and comparison of alternate methods and tooling. 474 pp.

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THE RONALD PRESS COMPANY 15 East 26th Street, New York 10

Industrial Briefs

Established . . . INTERSTATE STEEL CO., Minnesota, has established a St. Paul warehouse at 185 Eaton St. with Robert E. Walker as district sales manager.

Gets Contract ... DRAVO CORP.'s Piping Dept., Pittsburgh, has been awarded a contract by Colorado Interstate Gas Co. for 27 compressor headers.

Canadian Subsidiary ... EX-CELL-O CORP. has now extended its operations to Canada to serve its Canadian customers better. The new wholly-owned subsidiary is Ex-Cell-O Corp. of Canada, Ltd., at 120 Weston St., London, Ont.

Big Furnace... SALEM-BROSIUS, INC., Pittsburgh, completed construction of a 64-ft long, oil-fired continuous roller hearth furnace for the Winchester Repeating Arms Div. of Olin Industries, Inc., at New Haven, Conn., recently.

Expansion . . . A \$250,000 expansion of plant and manufacturing facilities at Watson-Stillman Fittings Div., H. K. PORTER CO., INC., Roselle, N. J., has been reported.

Distributor . . . WESTINGHOUSE ELECTRIC CORP. has appointed B. L. Robinson & Co., Burlington, Iowa, a full line apparatus distributor.

Major Step . . . MORGAN CON-STRUCTION CO., Worcester, has been awarded a contract for a new rod mill for the American Steel & Wire Div., United States Steel Corp., to be erected on properties of the present Cuyahoga Works, Cleveland.

Purchased . . . SUPERIOR TUBE CO., Norristown, Pa., has purchased a controlling interest in Fine Tubes Ltd., Surbiton, Surrey, England.

Hear Ye... The Northern Ohio Personnel & Executive Conference will be held Jan. 29 at the Hotel Carter, Cleveland. CLEVELAND CHAMBEROFCOMMERCE GROUPS will sponsor sessions on "Organization planning and development for the buyers' market."

Relocated . . . THE TRANE CO. has moved its Oklahoma City sales office to 819 North Virginia St. E. M. Jameson is sales engineer.

Congrats...ELASTIC STOP NUT CORP. OF AMERICA, Union, N. J., has received a special award for quality performance from Beech Aircraft Corp., Wichita, Kan. It was named best on product conformance, product performance, craftsmanship, packaging, quantity supplied and compliance with delivery schedules. The company was in competition with more than 400 Beechcraft hardware suppliers.

Bonus Approved...THE BRISTOL BRASS CORP.'s board of directors has approved a year-end bonus for employees and a dividend of 40¢ per share of common stock.

Honored . . . Philip M. McKenna, president, KENNAMETAL INC., Latrobe, Pa., has been named to receive the Holley Medal awarded by American Society of Mechanical Engineers at its annual meeting this week.

Rep Appointed . . . GREEN RIVER STEEL CORP., Owensboro, Ky., has appointed United Steel Supply Corp, as its representative for Michigan and northwestern Ohio.

Organizes Dept. . . . THE COLO-RADO FUEL & IRON CORP. has organized a new department to coordinate and expand product research and development in Washington, D. C., with Howard J. Davis directing the new office.

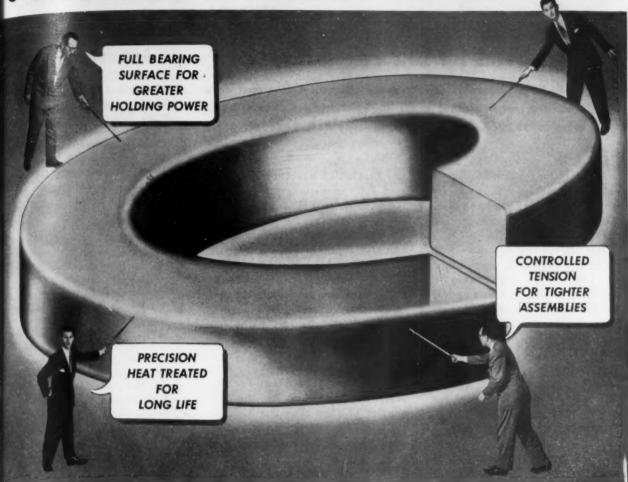
Get Increase . . . Seven thousand employees of THE GARRETT CORP., Los Angeles, have received a 3 pct pay increase, an average of 6¢ per hour.

65 Years Young . . . THE ALUMINUM CO. OF AMERICA celebrated its 65th anniversary last week on Thanksgiving Day. The company started with five men in a small shed on a back street in Pittsburgh, today employs 5000 and has a network of plants and offices across the country.

New Branch...MELDON STEEL CO., Brooklyn, and has completed arrangements for the site of its new industrial steel warehouse in Syracuse.

Arc Furnace . . . LECTROMELT FURNACES OF CANADA recently completed installation of a new 200 KVA Lectromelt arc furnace in an Ottawa laboratory of the Division of Mineral Dressing and Process Metallurgy of the Dept. of Mines and Technical Surveys in Canada.

YOU CAN'T BEAT GARRETT



SPRING LOCKWASHERS



Get greater holding power in each assembly with the exclusive Controlled Tension built into every Garrett Spring Lockwasher. Assures greater spring tension of correct pressure on every bolt and nut...longer life to every assembly.

Garrett makes a complete line of spring lockwashers of high carbon steel, bronze, aluminum, stainless-steel or monel metal...plated to your requirements. Garrett also manufactures washers to all Armed Forces Specifications...such as AN935, BECX1, BECX2, BECX3 and others. All are ready for...

IMMEDIATE DELIVERY FROM STOCK



GEORGE K. GARRETT COMPANY, INC.

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See High Sales for Low Priced Models

W. E. Fish, Chevrolet sales manager, predicts low cost cars will take larger market share in '54 . . . Sees overall sales close to '53 . . . But buyers get cagy—By R. D. Raddant.

If any one person was to be selected as the top auto sales expert and market evaluator, the man to beat would have to be W. E. Fish, general sales manager of Chevrolet.

After all, for two decades—1953 will be the twentieth year—Chevrolet has led all automakers in sales. This is a record that stands by itself and is the best evidence of Mr. Fish's ability as an automerchandiser and market expert.

Expert Opinion... Last week in a preview talk on 1954 market conditions, Mr. Fish laid down his own predictions. While he called them "only the personal guesses of Bill Fish" they provide an expert opinion that should be of value to every person or business related to the auto industry.

Mr. Fish's views are perhaps the most optimistic to be found in the industry, but some of his reasons for predicting excellent sales for his own division have overtones of economic caution.

First, he believes that the low price field will gain in percentage of the market, perhaps to prewar levels when the low price makers picked up 60 pct of the market.

Customers Buy Carefully . . . He points out that the percentage was far lower than that in the postwar period, crept up to 54 pct this year, but in the past weeks has been very close to the 60 pct prewar figure.

"This is because the purchaser is not going to take the works," he said. "He is buying more carefully, looking at the cost per month. Furthermore, social prestige connected with a more expensive car is not going to be quite the factor it has been."

Nevertheless, he looks for a record that will make 1954 the third best year in history and perhaps "very close to 1953." This means a domestic market of from 5.3 to 5.5 million passenger cars. This actually represents a big gain in Mr. Fish's own personal optimism. Only 2 months ago his predictions were several hundred thousand less, reflecting his feeling now that the nation as a whole is more optimistic.

Savings Are Challenge . . . As a result, Chevrolet is actually scheduling heavier output for the first quarter of 1954 than the division did in 1953, when production rates were some of the highest in history.

Mr. Fish's reason for this robust forecast is based on the tremendously high personal savings, which he calls a "challenge to pry some of it loose," and the fact that the 3-year cycle will bring 1950 customers in to trade in their cars bought in that record year.

Not Overproduced ... Chevrolet dealers have not joined in the clamor of overproduction that has spread throughout car dealers. GM actually made the decision in August to cut back production. This has left Chevrolet dealers in a position where they had only about a 2-week supply of cars 3 weeks before model introduction.

He admitted that stocks of used cars, the highest they have ever been at this time of the year, "could be troublesome," but that dealers are being urged to "make them saleable."

Are dealers in financial trouble? Chevrolet's 7600 dealers have more than \$1 billion in wealth represented in their dealerships and 92

Beginning of the End?

Cost-of-living wage boost of 2¢ per hour for General Motors hourly-rated employees last week followed latest quarterly revision of Bureau of Laber Statistics consumer price index. BLS index for Oct. 15 stood at 115.4, compared with 114.7 fer July 15. For salaried GM employees, the index rise meant a \$10 increase in quarterly cost-of-living allowances.

But there were straws in the wind that threatened this might be the last wage boost for a while under the GM-UAW "living document" wage formula. Washington has indicated it believes the inflationary trend is about over, with further living cost rises doubtful. BLS index changes have been minor during 1953. Another living cost index by National Labor Relations Board, actually declined in October.

pct made profits in August-October period.

Chevvy Still Leads . . . Some statistics on the Ford-Chevrolet battle throw a light on this highly publicized production and sales feud. He pointed out that while Ford has gained some 6 pct in its market share since 1940, Chevrolet has not varied as much as 1 percentage point. This means that while Ford is on the upgrade, it is not at Chevrolet's expense. Through September and 36 states reporting for October, Chevrolet is ahead on registrations in every state in the nation.

"We are not minimizing competition, but we are not giving up first place," he said. "Beat Chevrolet is a good battle cry. We used it ourselves 30 years ago when we said 'beat Ford,' but you can't sustain such a slogan for 20 years without showing results."

Didn't Change Horses ... Probably the significant fact to be noted in the introduction of the

1954 Lincoln line is that horsepower was not boosted from the already adequate 205 hp that was reached this year.

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While it doesn't actually mean the end of the horsepower race, Lincoln could have increased the horses to match others in the field if it had been considered of significant value. This decision will leave Chrysler at the top of the power heap with 235 hp with only Cadillac to be disclosed in the top power bracket.

Gets Face Lifted . . . In the new models, Lincoln has stayed with the basic 1953 car with what its official publicity calls "a multitude of mechanical improvements and styling refinements." The styling refinements are generally confined to bumper, grille, chrome treatment, and interior trim.

Mechanical improvements are concentrated in the engine, pitching it for smoother and more economical performance. Brakes are also larger with brake diameter increased to 12 in., resulting in a 10 pct increase in the braking area.

Carburetor Saves Fuel . . . The most significant engine change is the improved four-barrel carburetor employing a vacuum method of operating the second two barrels. In normal driving, only the first two barrels are needed, but whenever the power requirements of the engine exceed the breathing capacity of the primary barrels this vacuum diaphragm opens the secondary throttle plates to the exact position that will admit the right amount of additional fuel and air.

Purpose is to assure the power supply when required, improve economy by preventing waste of fuel through unnecessary use of the second barrels when engine is operating under a lighter load.

Whether intended or not, Lincoln's announcement was timed perfectly with the finish of the Mexican Pan-American road race in which Lincoln swept the first four positions in the large stock car division.

Trucks:

Manufacturers plan to offset smaller market next year.

On the less glamourous side of the business, truck manufacturers are hard at work to avoid any ill effects from what most experts agree will be a smaller market for 1954.

So far this year, 1953 truck production is running about even or slightly ahead of 1952. Not even truck manufacturers think next year will be so good. Part of the blame will fall on lower farm income and part on a less fluid market than for autos. The average truck lasts much longer than a car, eliminating a fast replacement business.

As a result, truck makers are trying to put some glamour into this glamourless business and most lines will show major improvements. Dodge trucks introduced earlier this fall had major changes and so have Chevrolet and GMC models introduced last week.

Automotive Production

(U. S. and Canada Combined)

WEE	(EN	DING	CARS	TRUCKS
Nov.	28,	1953	55,222*	18,923*
Nov.	21,	1953	.83,326	24,926
Nov.	29,	1952	86,659	27,656
Nov.	22,	1952	100,352	28,872
*Estir	nate	d. Source	ce: Ward's	Reports

Something new is an emphasis on styling and appearance. Truck drivers are being offered choices of upholstery, colors and trim that were never mentioned previously. Driver comfort is stressed and particularly in the light truck field a neat appearance is mandatory.

As one GMC official put it, "We want the farmer to be proud to take his truck to town."

While truck lines are too numerous to go into detail, here are some Chevrolet truck developments: New engines, automatic transmissions optional in some lines, heavier axle shafts, bigger clutches, seat developments, new grille, one piece curved windshield, improved truck bodies.

THE BULL OF THE WOODS

By J. R. Williams





How many times have you needed a little extra range or extra versatility for a milling setup? Just think how much it would have saved! You can get all the extra range and versatility you will need on your cincinnati knee-type milling machines by equipping them with Motor Driven Overarm Attachments. ¶ Consider the cincinnati No. 2 MI, for example. Of itself, it offers a host of advantages; convenient and easy speed change with one lever... a similar feature at the front of the knee for feed changes ... 16 spindle speeds, 60 to 1 ratio ... 16 feeds, 120 to 1 ratio ... unit construction for low-cost maintenance. To these advantages and many others, add the extra range and versatility offered by the Motor Driven Overarm Attachment, and you have a toolroom miller that can handle any job. ¶ The attachment is completely self-contained and

CINCINNATI

replaces the standard machine overarm. Power is derived from a motor mounted on top of the overarm. There are two sizes, 2 hp for 2ML, 2MI and Dial Types; 5 hp for Dial Types and High Power and Dual Power Dial Types. You may obtain more information by writing for publication No. M-1661-1.

No. M-1661-1.

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Biggest Budget Cuts for Foreign Aid

Overseas aid ripe for pruning . . . Defense spending will be pared—but cautiously . . . Elections may stall rewriting Taft-Hartley . . . Less labor interference—By G. H. Baker.

Biggest reductions in next year's government spending estimates are to hit foreign aid programs. Agreement on this point has now been reached by both the Administration and by congressional leaders.

Military spending, while it also is due for the paring-knife treatment at the Capitol, is headed for reduction on a smaller scale.

Reasoning behind this approach to reduced federal outlays in the fiscal year starting next July 1 is based on recent samplings of grassroots political opinion by Senate and House members of both parties. In brief, the political attitude they report as prevalent in many sections of the country is that foreign aid—with the exception of maintaining U. S. troops abroad—is long overdue for drastic reduction.

Where to Cut?... But questions dealing with a lower defense budget are reported yielding definitely mixed reactions. Sure, congressmen report, everybody is in favor of less spending. But, you ask them where the budget is to be cut and nobody wants to take a stand.

The multimillion dollar industry called "defense" that has come into being in the past 12 years is now related directly or indirectly to nearly every household in the land.

With this in mind, there is a growing feeling within Congress that defense procurement activity had best be left for the next fiscal year at or near its present level.

Thin the Ranks . . . There is, however, one sizable area of military spending that's being eyed for

reduction. This is the military payroll. It is reported that personnel-reduction plans now under discussion by Defense Secretary Wilson and his top aides call for a straight 10 pct across-the-board cut in uniformed strength, with anticipated savings of about \$1 billion annually.

Biggest savings resulting from such a personnel cut would come about not so much through savings in paychecks, but through the closing down of military bases and from the reduced demand for the supplies and equipment needed to sustain an estimated 300,000 uniformed men and women.

Rewrite Taft-Hartley?... Take it from the ranking minority member of the powerful House Labor Committee: Prospects for rewriting the Taft-Hartley law next year are definitely waning.

If the controversial labor law was to be revised at all, as Rep. Graham A. Barden, D., N. C. sees it, 1953 was the year to do the job. No general elections were scheduled, and Congress as a whole would have been able to maintain a relatively objective

AJAX GIRDLE CO. BUSINESS CHART

1953
1952
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"We're not in such bad shape, J. B.,,

viewpoint in its debate and voting.

Play Practical Politics... Next year is a wide-open congressional election year. With all of the House membership and one-third of the Senate membership up for re-election, practical politics, rather than judicial reason, threatens to dictate the scope of rewriting the labor law.

President Eisenhower's promise to revise Taft-Hartley to eliminate "unfair" provisions thus is in jeopardy. The "heat, excitement, and confusion," as Mr. Barden puts it, attending all election-year law-making point up the definite possibility that the law will remain on the books in its present form for at least another year.

Cut Labor Interference... Participation by the Federal Government in labor disputes is to diminish, not increase, in the months ahead. National Labor Relations Board Chairman Guy Farmer is charting this new policy. He believes NLRB has standing orders from Congress to regulate cases having "substantial impact" on interstate commerce. Cases not measuring up to this standard are to be left to local agencies.

As Mr. Farmer sees it, the time is now at hand for Washington bureaucrats to accept the proposition that it is neither necessary nor desirable for the government to stick its fingers into every pie involving labor disputes. Federal agencies should, as a matter of self-restraint, impose limits upon their own power.

Tungsten Trouble . . . Congressional hearings on charges that certain sales of Far Eastern tungsten to the government were unethically handled will begin this week.

Rep. Charles B. Brownson, R., Ind., said recently his subcommittee on international operations has evidence that four mining firms in Thailand ignored scheduled deliveries of tungsten when world prices rose past the con-

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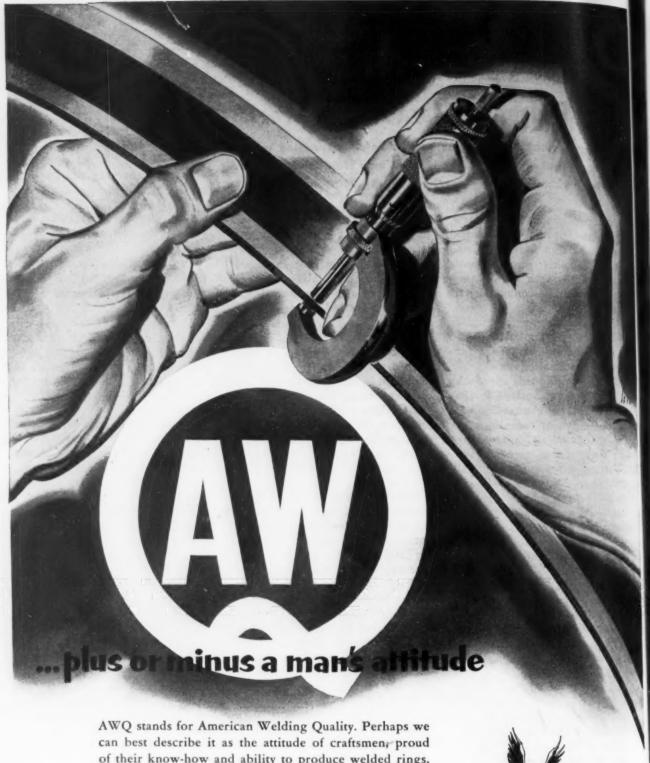
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AWQ stands for American Welding Quality. Perhaps we can best describe it as the attitude of craftsmen; proud of their know-how and ability to produce welded rings, bands and welded assemblies . . . or to be more specific, craftsmen who treat every job with the same degree of care that you insist upon in your own plant.

If your requirements involve either fusion or resistance welding of ferrous or non-ferrous metals, call or write us. We can put our 35 years of welding experience — the latest techniques and equipment—and 1600 conscientious hands to work for you.



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tract figure. When prices fell below the amount set down in the
agreement, Rep. Brownson added,
the companies brought their ore
into the market and resold it to
the U. S. at the higher contract
price.

These "shenanigans," according to the lawmaker, meant a loss to this government of more than \$1 million. Rep. Brownson also believes someone in the emergency procurement service (part of General Services Administration) was fully acquainted with this aspect of the transaction. He wants to find out who was responsible.

Social Security:

Plans to drop the scheduled rate increase meet opposition.

Rolling a boulder uphill may be as easy as the Administration's trying to win a cancellation in the scheduled rise in Social Security taxes.

On Jan. 1, the tax rate—now $1\frac{1}{2}$ pct of the first \$3600 in employee wages, matched by the employer—is to become 2 pct.

As he indicated in May, President Eisenhower wants the increase dropped. In addition, he hopes Congress will approve his proposal that Social Security coverage be extended to 10.5 million more people. If he's blocked on the tax rate issue, his entire social welfare program may suffer a setback.

Reed, Curtis Not Sold

Party lines have little to do with congressional views on the amount of the tax. There's enough apparent opposition, in both Republican and Democratic ranks, to the President's request to indicate a tug-ofwar may ensue next year.

Recently, the President tried and failed to swing two key members of the important House Ways and Means Committee to his view. Chairman Daniel A. Reed, R., N. Y., and Rep. Carl T. Curtis, R., Neb., head of the Social Security subcommittee, still say they want the increase.

Speaking of the Social Security

reserve fund, now approaching \$19 billion, Mr. Reed let it be known that he doesn't want "my party to be charged with depleting the reserve, which is for the protection of the people."

Political Handicap

Some of his colleagues, however, point out that the higher tax could work against G.O.P. candidates at election time. Rep. Richard M. Simpson, R., Pa., a Ways and Means Committee member, can cite cases where a taxpayer will lose more through the Social Security rate boost than he will gain from the personal income tax cut booked for the end of this year. Many Republicans fear this may have a bad effect politically.

Jobs:

Employment eases slightly but see pickup after Jan. 1.

Although demand for labor has slackened during the last 2 months in a period when employment normally rises, Labor Dept. isn't greatly disturbed and looks for a different trend after end of the year.

A nationwide survey by Bureau of Employment Security indicates what Labor calls a "mild easing" in the labor markets at major production centers.

But from an overall viewpoint, employment conditions show very little change and continue at a record level. Easing off of labor demand added only about 125,000 to the roster of claimants for unemployment compensation and kept unemployment at the record postwar low of 1.2 million.



"Now, boys, I want you to—ha-ha—stop me if you've heard this one."

A downward trend in steel employment seems to be leveling off, the bureau says. Indications of a pick-up at Pittsburgh, Wheeling, and Philadelphia is looked for to offset some small reductions in force foreseen for Allentown, Youngstown, and Canton.

Living Costs:

BLS index up 0.2 pct in Oct., but only 1.1 pct over '52.

Bureau of Labor Statistics reports that the cost of living rose 0.2 pct from September to October, an increase for the eighth straight month and an alltime high.

This means that several hundreds of thousand workers whose wage contracts are tied in with the BLS index are to get a 2¢-per-hour pay increase.

Price increases were registered in many categories but food, which accounts for about 26 pct of consumer spending, showed a drop of 0.2 pct.

This puts the rise in the cost of living at 1.1 pct above a year ago, leading to official comment by Labor Dept. that prices are "practically stable" and might go down a bit in the next few months.

At the same time, Agriculture Dept. reports that its check on the economy shows that income per person is now \$1553, \$56 over '52.

Court Stymies NLRB Commie Ban

National Labor Relations Board's get-tough policy on alleged communist union officials has been side-tracked by a federal court.

In Washington, Federal District Judge Richmond B. Keech refused to stay his earlier order requiring the NLRB to stop cracking down on suspected communists who hold union office. Judge Keech holds that the NLRB is "without authority" to set such a policy.

Dispute stems from the decision of NLRB Chairman Guy Farmer to withhold authorization as bargaining agent from any union if one of its officers has been indicted on charges of false statements in connection with non-communist oaths.

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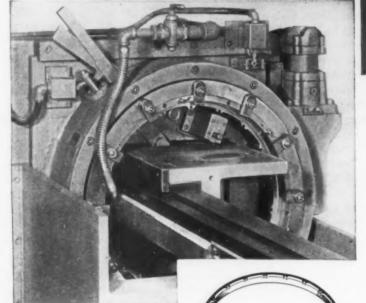
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the COLOXIAL method

At Colonial, experience, imagination and competence are applied

- to the design and manufacture of each of the individual components of a complete broaching installation, and
- 2 to the effective combining of ALL components into a completely UNIFIED BROACHING installation making them work as a "team."



WHAT'S AHEAD ?

Keep up with the latest developments: Read "Broaching News". We will be glad to see you get it regularly if you will drop us a line on your company letterhead.

2 Colonials Broach JET BLADE SUPPORTS

Heat and corrosion resistant steel 223/4" 1.D. jet engine blade supports, are broached on internal contours on two 10-ton 90-in. stroke standard Colonial horizontal machines at 3 per hour. 18 passes are required per machine. Metal approximately 3/4" deep, 31/2" wide, and 1/2" thick is broached in two passes.

Machines, broaches, fixtures, etc., were all designed by Colonial as a UNIFIED BROACH-ING INSTALLATION.



WIT HILLIAM

Coast Highway Steel Needs High

New California road budget of \$205 million highest on record . . . Use about 160,000 tons of steel for \$50 million of steelwork . . . Push welded sections—By T. M. Rohan.

There's a slug of steel going into California highways and bridges next year.

The California highway department last week adopted the highest regular construction budget of any state in U. S. history at \$205 million for the fiscal year starting July '54. Figure is 82 pct over the current year's \$118 million, unchanged from last year, does not include toll road construction such as the \$62 million San Francisco bay crossing now under construction.

\$50 Million in Steelwork . . . Although no breakdown is yet available, one of the state's leading construction firms estimated the whopping budget will represent about \$50 million installed steelwork, about double this year. Steel tonnage will probably hit between 150,000 to 175,000 tons, heralding good business for the West's heavy capacity in bar mills.

Increased budget was made possible by tax hikes of 1.5¢ per gallon on gasoline and 2.5¢ on diesel fuel for a 2-year period. Although the budget calls for 585 mi. of road, moneywise a heavy percentage will go into the vast freeway (expressway) systems of Los Angeles and San Francisco bay area which consume heavy steel tonnage. Costs on this overhead construction run about \$5 to \$6 million per mile, compared to about \$400,000 to \$500,000 per mile for roadbuilding at grade level.

1/2"

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Link Bay Bridges . . . Currently the final \$44 million section is progressing which will link the Golden Gate Bridge with the Oakland Bay Bridge and south to U. S. 101, toward Los Angeles.

In Los Angeles latest reports to midyear indicated \$178 million had already been spent on free-ways since the start of work some years ago. Most spectacular links are the \$55 million, 10-mile Holly-wood freeway nearing completion and a new 4-level crossover also recently opened.

Welds Not Rivets . . . In an effort to shave costs on freeways California has led the nation in pioneering welded rather than riveted construction, largely over objections of steel companies. In San Francisco this summer the longest all-welded overpass section in the U. S., a \$17 million "interchange" was completed.

Steel savings of up to 15-20 pct are being claimed by California highway engineers through welding rather than riveting. In a traditional steel deficit area this gives added mileage per dollar and lower costs.

Clearing the Air

All 58 Los Angeles County iron foundries are now complying with anti-smog regulations, A. H. Rose, air polution control district engineer reported last week.

Mr. Rose told a district meeting they previously were considered the worst offenders, each discharging 50 to 200 lb. of air contaminants per hour.

He said that at a cost of between \$17,000 and \$100,000 each, 41 have installed baghouse equipment operating on the vacuum cleaner principle, 13 have replaced cupolas with reverberatory furnaces, 3 have electrostatic precipitators and 1 has a water and wash system.

Steel engineers have taken a cautious attitude regarding the bridges and overheads, preferring traditional riveted construction. They point out complex rigid frame construction with allied fatigue problems are not involved.

Need More Literature . . . Also over 300 detail drawings in excess of those supplied by the state were necessary on one connection alone, boosting engineering costs. Lack of welding literature on proportions of thin to heavy material makes them suspect many designs are close to maximum limits. And vast fabrication floor areas for shop welding sections, special jigs and handling of 50-ft lengths and special edge preparation strong welds boost time trouble involved.

But specifications called for welding, and use of 50-60 ft rolled beams, so they have followed through. The first California all-welded bridge, a 1342-ft span put up in 1941 has so far failed to show visible cracking of welds. The German autobahns on which the butt-welded splice technique originated has experienced cracks although subject to heavy wartime use.

In addition to state construction, an independent research group this year reported a backlog of \$350 million of "urgently needed" California county work. The report stated county construction is 10 years behind swelling population growth.

Defense Order Pickup... West Coast defense suppliers of ordnance and other heavy equipment last week were mapping increased sales after a 3-month dry period. J. D. Towne, ACF-Brill vice-president and manager of Hall-Scott Motors, Berkeley, Calif., said bid solicitations for at least \$2 million business had been received by weeks' end after no inquiries for 3 months.

Users report excellent results with New Sunicut S Oils

In just six months, these unique new straight cutting oils have "Job Proved" themselves as top performers in many metalworking shops all through the industry.

Reports like these keep coming in:

AN AUTO PARTS MANUFACTURER

INFORMS US, "Threaded parts are as much as 50° cooler when they come off the machines. And our operators like the clear, clean, odorless qualities of Sunicut 102-S."

SCREW MACHINE SHOPS REPORT, "The versatility of Sunicut 209-S permits us to reduce the number of oils we must stock."

BROWN & SHARPE SCREW MACHINE OPERATORS SAY, "Sunicut 11-S increases tool life, gives finer finishes, eliminates staining problem."

LARGE IMPLEMENT MANUFACTURER

TELLS US, "We get better finishes in our broaching operations with Sunicut 110-S, and our operators favor its light color."

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Builders Must Woo Replacement Market

Biggest potential replacement market is small to mediumsized plant, job shops . . . They want flexible, moderately priced tools . . . New design trends—By E. J. Egan, Jr.

There are plenty of facts and figures to convince machine tool builders and buyers alike that much of the metalworking equipment now in use is obsolete and should be replaced to improve production efficiency.

Biggest potential replacement market is among the thousands of small to medium-sized metalworking manufacturers and job shops, where it is estimated that one out of every five machine tools is over 20 years old. Two out of every three machines are judged to be of pre-World War II vintage.

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Eye Replacement Market . . . With the pressure of war and defense orders for special purpose equipment easing to a marked degree, machine tool builders are aiming at the somewhat neglected replacement market. The need in this market is for flexible, accurate, moderately priced machine tools.

Single purpose machines won't match the needs of the small metalworking shop whose stock in trade is its ability to handle a wide variety of work on multi-purpose equipment. But many of the design features built into production tools can and are being adapted for greater 'versatility and more output per man-hour from standard machines.

Biggest problem is to strike a balance between the cost and degree of automation and special control devices needed on general purpose machine tools.

Spotlights Design Trends . . .

Some of the design trends which could possibly woo the owner of obsolete equipment into the replacement market were pointed

out recently by Frederick S. Blackall, Jr., president and treasurer, The Taft-Peirce Mfg. Co., Woonsocket, R. I., and president of The American Society of Mechanical Engineers.

Speaking before the ASME Cincinnati Chapter, Mr. Blackall said general purpose machine tools don't need the weight, automatic controls and complex features of the high-production equipment, but they should be built to the same degree of precision. Sturdy construction is a must in order to permit use of carbide tools at their maximum capacity at all times.

Machine operation at maximum speeds and feeds will be of great advantage in lowering production costs. But practical use of infinite changes in speeds and feeds will come only with trouble-free hydraulic mechanisms and electronic controls.

Stress Optics . . . Other costsaving features will be built-in to facilitate setting-up, loading and unloading, gaging and checking. Air, electric and electronic gaging devices are particularly suitable for incorporation in the machine tool itself. Optics will be increasingly applied to problems of machine tool gaging and control.

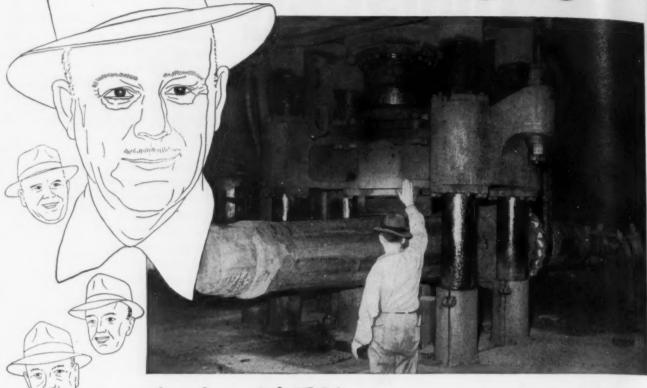
Mr. Blackall predicted that hardened and ground ways of steel, or of steel inserts, would eventually replace the traditional hand-scraped, cast iron variety. When used with ball or roller bearing supports or plastic facers, lubrication is simplified.

Eliminate Finish Grinding . . . Higher precision and finer, superspeed finishes will be attained as methods for evaluating surface finish are improved. It may be possible to eliminate finish grinding operations as lathes, millers and boring machines are built to higher standards of precision.

A French firm is now producing a planer which planes in both directions, eliminating time lost on the return stroke. Mr. Blackall predicted that this development will take hold.

Hits Tax Policy . . . Approaching the matter of machine tool replacement from the depreciation allowance viewpoint, Tell Berna, general manager of the National Machine Tool Builders' Association, told a meeting of the New York Society of Security Analysts last week that U. S. tax policies are forcing use of obsolescent machines, urged a tax change.





and the MEN who make them



Meet Al, Don, Roy, Tony, Jack, Jim . . . Finkl press smith crews that make quality forgings and die blocks. Here, working with a 78,000 pound ingot of special analysis steel from Finkl's melt shop, these experienced men combine their skill and pride of workmanship to produce forgings and die blocks which prove that the finest product is the least expensive to you in the long run.

For 74 YEARS, "Forgings by Finkl" has meant dependability and quality. For 74 YEARS we have zealously guarded that reputation. And now, with complete control of quality from the analysis of the steel in our own melt shop through to the finished product, we can honestly say that Finkl forgings and die blocks are the finest available at the lowest cost to you.

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A. Finkl & Sons Co.

ELECTRIC FURNACE STEELS . DIE BLOCKS . FORGINGS

REPORT TO MANAGEMENT . .

Political storm center You may indirectly be enmeshed next year in a political battle centered around production and employment. Should any fair-to-middling economic downtrend materialize, unions and democrats will ballyhoo it as fodder for '54 Congressional elections. With some unions already weeping about economic perils ahead, artful groundwork is being laid to harass the Administration. Fortunately, positive economic forces of continuing high employment and demand may paralyze such an assault.

Prosperity springboard Your springboard for prosperity next year will be record production in 1953. Federal Reserve Board says gross national product in '53 will total about \$368 billion-5 pct ahead of 1952's peak \$350 million. At \$285 billion, personal income this year will be 6 pct over '52. Other FRB points: To keep output at peak, any slack in defense spending must be tautened by a resurgence of consumer demand. Business inventories may be \$5 billion this year against \$3 billion in '52. Private home building has declined 10 pct through the year although total volume now about equals 1952. October private housing starts numbered 8 pct fewer than '52. Personal savings may set a new record.

Consumer prices stable

Two consumer price indexes fluctuated in divergent directions last week. National Industrial Conference Board's 10-city cost of living index inched down 0.7 pct from September to October. Meanwhile, Labor Dept.'s index rose 0.2 to 115.4 during the month through mid-October. It all goes to show that indexes travel the way they've been weighted. Our case for remarkably stable consumer prices still stands. Though a further consumer price dip is possible in months ahead, it will be as fractional as gains in the past year. On Dept. of Labor's industrial commodity price front, stability prevailed. For October, price index for non-food commodities crept down to 114.5 from September's 114.7 and metals, metal products edged to 127.8 from 128.5.

Sales retreat stemmed October retreat of department store sales seems to have halted. Upswing started in the week ended Nov. 7, when sales were 3 pct over '52, and extended into the week ended Nov. 14, with a 2 pct rise over '52. Christmas buying zeal may furnish the momentum needed to carry total 1953 sales over 1952. For the year through Nov. 14, department store sales stood 2 pct over last year.

What props payrolls up Though the workweek has gradually shortened through the year, increased hourly earnings are propping payrolls at peak levels. In mid-October factory production workers were earning an average \$71.33 a week--or \$1.35 higher than October 1952. At \$1.78, October gross hourly earnings were 8¢ an hour above last year. From September's 39.6 hours, the workweek in mid-October rebounded to 40.3 hours, still somewhat below the World War II average for the month.

Ups, downs of output

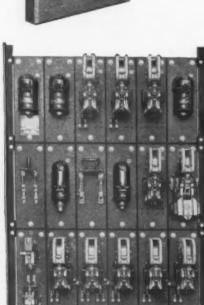
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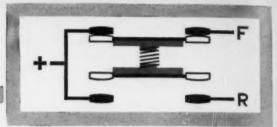
More up and down brushstrokes could be painted on the production picture this week. Total net value of industrial furnace orders for the first 10 months 1953 was \$53.4 million against \$61 million last year. Machine tool backlog of orders eased to 6.6 months against 7 months in September. Loading of revenue freight for the week ended Nov. 14 showed a 12.3 pct decrease from 1952 but only a 2.8 pct dip from the preceding '53 week. Dun & Bradstreet reports October volume of building permit values in 215 cities at \$424 million, or 3.7 pct over September and 1.8 pct higher than 1952.

Safer Electrical Interlocking on All EC&M LINE-ARC CONTACTORS





Typical Crane-Hoist (Wright Circuit) Controller with improved LINE-ARC Contactors,



Two sets of double-break contacts—<u>isolated</u> from <u>each</u> other—no carry-over from one to the other by an arc.

A Good Reason for Specifying EC&M Magnetic Control

Magnetic contactor controllers use electrical interlocks to maintain safe motor connections, to regulate sequence of contactor operation, and for other important functions that promote efficient operation of motors or of control or of both motors and control.

On controllers using the EC&M improved LINE-ARC Contactors, a NEW Interlock provides <u>safer</u> interlocking with <u>lower maintenance</u>. The new upper and lower stationary contacts have double-faced contacts which can be moved from one position to the other for double the wear.

Movable contacts, carried in an insulated slotted frame attached to the contactor arm from the front, are easily inserted or removed without tools. The normally-open contact bridge is <u>isolated</u> from the normally-closed bridge by two insulators (shown in red in the sketch above). These insulators keep the spring in alignment and <u>prevent</u> the spring from carrying current from one bridge to the other.

Coin-silver contacts are used on these new electrical interlocks. With two movable contact bridges (instead of one previously used) and <u>each isolated from the other</u>, normally-closed circuits <u>cannot</u> be carried over by an arc to <u>normally-open</u> circuits or vice versa.

Safer electrical interlocks—a good reason for specifying EC&M Magnetic Control.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET CLEVELAND 4, OHIO



FOR ALL TYPES OF BALL AND ROLLER BEARINGS: 4" BORE TO 120" OUTSIDE DIAMETER Special KAYDON two-row Angular Contact Ball Bearings, 12,000" x 13,440" x 1,375" (THIN SECTION)

These KAYDON-bearinged BELL Anti-Submarine Helicopters won't be outsmarted!

NAVY'S latest "bad news" for unwelcome submarines are the HSL-1 Bell Helicopters . . . most powerful tandem-rotor 'copters known . . . big but compact, with high speed, long range and all-around performance "beyond expectations".

Special thin-section KAYDON two-row angular contact ball bearings, used on the swash plates, contribute much to the compactness, speed, con-

trolability and stability of these modern defenders of America. • KAYDON cooperates with many designers and technicians in terms of precision bearings that improve aircraft, automotive, military and industrial equipment . . . to help make many products better, faster, more profitably.

On units you make to sell, or buy to use, specify KAYDON bearings. Contact KAYDON of Muskegon.

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KAYDON Types of Standard and Special Bearings:
Spherical Roller • Taper Roller • Ball Radial • Ball Thrust
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PRECISION BALL AND ROLLER BEARINGS



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Warehouse and mill shipment with more than 200 seamless tube sizes to choose from .950" O.D. to 8,750" O.D.

BARS

In sizes from .171" round to 8.750" round. Warehouse and mill shipment.

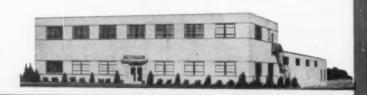
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Mill shipment of hot rolled or cold drawn ball, roller and needle wire.

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Continued

Floor surface

New floor, named Metile, provides a wear-resistant surface suitable for use in areas subjected to seven est type of hard industrial usage Floor consists of steel plates of an proximately 1 sq ft embedded in especially installed concrete. Sta plate is so constructed that numer ous anchorage points secure plate to concrete and prevent buckling a movement either vertically or hori zontally. Metile floors are equals suitable for surfacing over new o old concrete, sound wood bases wood block or brick, with som variation in the material selection in the basic bedment grouting course in which plates find permanent anchorage. Flash-Stone Co. For free copy circle No. 13 on postcard, p. 137.

Finishing equipment

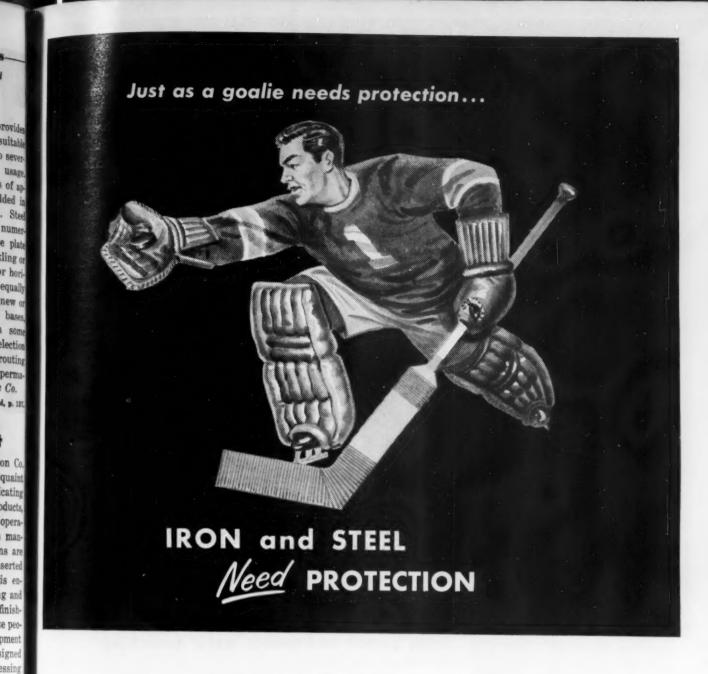
Picture story of R. C. Mahon Co. has been published to acquaint people with company's fabricating and production facilities, products, services and scope of its opentions. Examples of products manufactured in various divisions are illustrated. Broadwide is inserted to aid in visualizing what is entailed in planning, engineering and installing complete modern finishing systems, and to familiarize people with major units of equipment which must be specially designed and built to meet the processing and production requirements of individual manufacturer. R. C. Mahon Co.

For free copy circle No. 14 on postcard, p. 137,

Anodes and chemicals

Recent 16-p. bulletin describes and illustrates complete line of H-VW-M anodes, anode accessories, plating processes and plating chemicals. Specifications and recommended applications are given. Bulletin also describes 30 salts commonly used in electroplating baths. In addition, bulletin tells how to test local thicknesses of electrodeposited cadmium, zinc, tin, copper and H-VW-M albaloy. Hanson-Vam Winkle-Munning Co.

For free copy circle No. 15 on postcard, p. 137.



If your product is made of iron or steel, and exposed to the elements, protect it against the ravages of rust by Hot-Dip Galvanizing — the best possible rust preventive when applied by Hanlon-Gregory. For longer life, greater uninterrupted service and substantial savings in maintenance, specify Hot-Dip Galvanizing . . . SEAL IT IN ZINC.

HANLON-GREGORY GALVANIZING COMPANY

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AGE

galvanizing ... pickling ... painting ... oiling



IN THE HEART

OF THE STEEL INDUSTRY

December 3, 1953

New and improved production ideas, equipment. services and methods described here offer production economies . . . just fill in and mail the postcard on page 137 or 138.



Visual gear analysis requires no master gear

Gear analysis can be accomplished visually by optical gaging methods with the OGP gear analyzer. Direct observation of a magnified gear image allows inspection, analysis, and gaging of the gear under simulated operating conditions. Need for interpolated data is eliminated. The gear analyzer checks a wide range of gear sizes and no master gear is required. Complete analysis of running conditions can be made even when gear operates with back-lash The analyzer works on the follow. ing principle: The gear is viewed as it rotates in contact with-and at the correct center distance from a composite rack chart. The analysis is made by observing the running action at a magnified projection on a Model 3 Kodak contour projector. Flexibility of the analyzer permits a variety of checks. Optical Gaging Products, Inc.

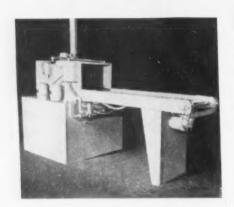
For more data circle No. 16 on postcard, p. 137.



Crane for indoor-outdoor materials handling

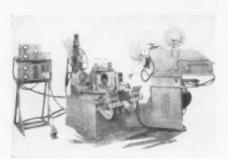
Combining the best features of crawler, truck and erection cranes with those of industrial shop cranes, the new Austin-Western machine is self-propelled and hydraulically operated. Four functions are involved: turntable rotation, boom elevation, raising and lowering of cable and hook, and power extension and retraction of the boom. The crane's overall height of 9 ft x width of 8 ft meet door and aisle requirements in the vast majority of cases. Austin-Western Co.

For more data circle No. 17 on postcard, p. 137.



Brine quench unit speeds metal quenching

New brine quench unit is designed to speed quenching of heat-treated metals through automatic cycling. The self-contained unit features completely automatic transfer of work load from adjoining heat treating furnace through its own brine quench. The brine quench has been developed for use with Ipsen series T metal treating furnaces. Load capacities of the compact, welded steel unit are 300, 400 and 700 lb. Solution temperatures, work handling and solution circulation are all controlled automatically by presettings on controls built into the regular furnace control panel. Brine solution temperature is controlled by immersed cooling coils through which tap water passes. Ipsen Industries, Inc. For more data circle No. 18 on postcard, p. 137.



Special welding machine offers full automation

Both internal and external welds in heavy wall bearing shells are made on a special welding machine that offers full automation with high production. Manual air operated flux back-up is built into the clamping fixtures for internal welding. The operating and indexing cycles are completely automatic under operator control. Automatic light beam gaging of the shell seam and automatic ejection of the welded shell are other features. Morton Mfg. Co.

For more data circle No. 19 on postcard, p. 137. Turn Page

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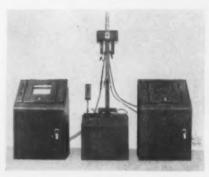
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AGE

CLEARING PRESSES

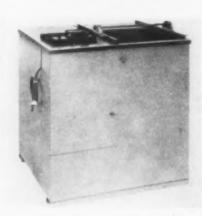
THE WAY TO EFFICIENT MASS PRODUCTION

CLEARING MACHINE CORPORATION, 6490 West 65th St., Chicago 38, Illinois . HAMILTON DIVISION, Hamilton, Ohio





IL HILLAN LIKHARIF





Gage uses beta rays to measure thin walled tubing

Gaging small diameter, thin walled tubing with extreme accuracy is claimed for a new instrument, that utilizes beta rays from a radioactive source to measure the wall thickness and roundness of the tubing. A source of beta radiation, moved inside the tube in relation to a sensitive means of detecting radiation on the outside of the tube, is the heart of the device. Changes in the thickness of the tube's wall affect the amount of radiation passing through the wall. Changes are translated into thickness readings and pen-traced on a recorder chart. Tracelab, Inc.

For more data circle No. 20 on postcard, p. 127.

Transfer machine rated at 75 blocks per hour

Designed for the automotive industry, this horizontal transfer machine is being used in the manufacture of V-8 cylinder blocks. It is two-station hydraulic-feed specialized production equipment for core drilling and semi-finish boring camshaft bearings, and for drilling

various other holes in both ends of cylinder blocks. The machine utilizes Peerless unitized transfer sections and hydraulic feed units; has fixed-center ball-bearing heads with oil circulating pump for lubrication. Peerless Production Co.

For more data circle No. 21 on postcard, p. 137.

Adjustable motor speeds provided from ac power

The Vari-Amp magnetic amplifier motor drive is a compact, self-contained unit that will provide adjustable motor speeds from an ac power source. It converts ac power from a 115 v 60 cycle source to dc power which is used to drive a dc motor. Speed is continuously adjustable over the complete range by means of the small rheostat lo-

cated on the control station. The unit consists of three components: the main control panel, the control station and motor. Standard unit will provide for speed range of 10 to 1; is available with motors of 1/40 to ½ hp. Magnetic amplifier unit contains no tubes or moving parts. Clark Controller Co.

For more data circle No. 22 on postcard, p. 137.

Jet plater for bright gold and silver processes

All the necessary equipment for mass production plating of precious metals or small scale laboratory pilot plant operation is combined in the new portable jet plater. Agitation is accomplished with a jet arrangement at the bottom of the tank that produces continuous rapid movement of the solution. Completely automatic in operation, the jet plater consists of a Sel-Rex se-

lenium rectifier with an automatic timer, of the proper output rating for the tank size; stainless steel tank, which can be used as the anode, with a water compartment for temperature control; movable work rack that will accommodate portable plating barrel. Models have 10, 20 or 30 gal capacity tanks. Sel-Rex Precious Metals, Inc.

For more data circle No. 23 on postcard, p. 137.

Fork truck converts to dumper with automatic unit

A new rotary dumping mechanism slips readily onto the forks of this Automatic FF-15 electrical industrial truck, converting the truck from fork operation to dumping operation in less than 20 min. Dumping action permits forward

rotation of 190° by using hydraulically actuated pinion gear arrangement. The truck's permanently attached forks are hydraulically adjustable for large or small materials. Automatic Transportation Co. For more data circle No. 24 on postcard, p. 137.

For more data circle No. 24 on postcard, p. 10.

Turn Page

Udylit

LABORATORY CONTROL MAKES
THE DIFFERENCE!

In cadmium plating, good results, time after time, are due to tested supplies and ingredients. Quality must never vary. That's where Udylite thoroughness pays off! "Uniformity through laboratory control" is the keynote of all Udylite supplies. For example, check these materials used with new Udylite BRY-CAD:

- The unvarying purity of Cadmium Ball Anodes—which Udylite originated
 —is an example of Udylite uniform quality. All anodes are spot-checked to
 maintain uniformity of size, content and weight.
 - Udylite Ball Anode containers are designed to use anodes to the last ounce—as well as maintain maximum anode area.
 - Udylite Cadmium Salt #153 contains all basic components of the cadmium bath. You can be sure that the chemicals used are finest quality . . . and mixed in EXACT proportions for best results.
 - Udylite Brightener #53 used in the BRY-CAD Process results from years of laboratory research.

So... for best results... for uniformity in plating on YOUR jobs... choose Udylite anodes, containers, materials. Call your Udylite technical man or write direct for complete lists of supplies. THE UDYLITE CORPORATION—DETROIT 11, MICHIGAN. West of Rockies, L. H. Butcher Co., Los Angeles 23, California.

Note various items of intricate shape plated with the new Udylite BRY-CAD.

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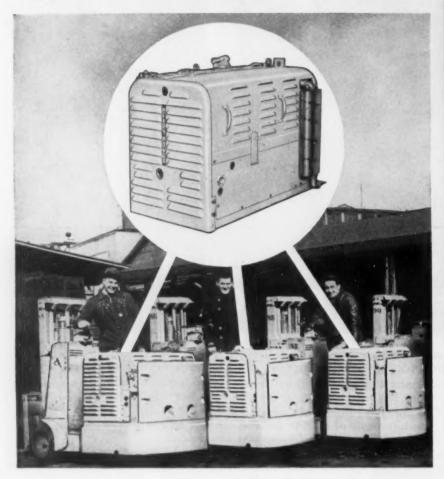
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PIONEER OF A BETTER WAY IN PLATING



Ready-Power is the only Interchangeable gas-electric power unit



Interchangeable Ready-Power units allow the most simplified and economical system of preventive maintenance known, with no truck downtime! One spare power unit permits rotation of maintenance operations while trucks stay "on the job" . . . an important reason why Ready-Power automatic electric drive moves materials at lowest cost per ton mile!

AND CONSIDER THESE ADDED FEATURES . . .

- ONLY READY-POWER has a manufacturing know-how backed by more than a quarter-century of experience in building gas-electric
- ONLY READY-POWER offers Diesel-electric power units for electric
- industrial truck operation.

 ONLY READY-POWER has a complete range of sizes in both gaselectric and Diesel-electric power units to meet the requirements of all sizes and types of electric industrial trucks.



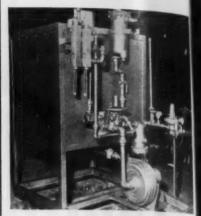
The READY-POWER Co.

3822 Grand River Ave., Detroit 8, Michigan

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

New Equipment

Continued



Protective atmosphere

New endothermic type protective atmosphere generator for protect. ing metals during heat treatment is available in a range of sizes from 250 to 3000 cu ft per hr output. The generator features a rectangular alloy retort in the small sizes and centrifugally cast alloy retorts in the larger sizes. It is electrically heated by radiant tube type elements that can be changed without interrupting operation. Provisions are made for admission of enriching gases for extra brightness of special work. Units are complete with flow meters and regulators, safety equipment and automatic temperature controls. Automatic atmosphere control apparatus is also available. Ferguson Equipment Corp.

For more data circle No. 25 on postcard, p. 137.

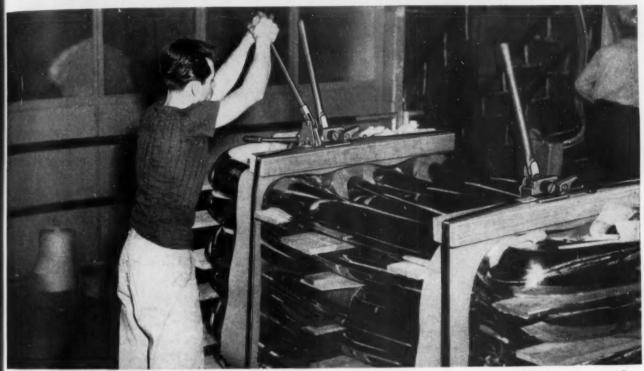
Non-skid floor paint

Factories and institutions can actually safety-proof all floors with a new non-slip, non-skid paint. This floor paint, known as Sure-Grip, is a specially formulated plastic liquid into which is incorporated a considerable amount of grit of neardiamond hardness. It is thicker than regular floor paint and its rough surface sets up traction that prevents falls even when wet. It is brushed on in one coat, requires no primer, is equally effective over wood, metal or concrete floors, and covers 75 to 100 sq ft per gal. Available in red or gray. Colonial Refining & Chemical Co.

For more data circle No. 26 on postcard. p. 137. Turn Page

Acme Steel Strapping Insures S.A. (State Actival)

Saves time and trouble palletizing automobile bumpers



BUMPER-TO-BUMPER. Each multi-bumper unit is securely bound with Acme Steel Strapping, all ready to be moved by fork lift truck.

Shipping hundreds of awkward-to-pack, hard-to-handle automobile bumpers to auto assembly plants presents no problem to United States Spring & Bumper Co., Los Angeles. They quickly fasten each pallet-load of bumpers together securely with Acme Steel Strapping, making large easily-handled units.

This makes individual wrapping and loading unnecessary. And it takes only a matter of minutes to strap these bumpers onto pallets.

Acme Steel Strapping saves time, money and weight, protects each pallet-load from damage and insures S. A. (Safe Arrival).

Whatever packaging problems you may have in your plant, chances are that Acme Steel Strapping or Acme Steel Stitching can solve them. Ask your Acme Steel representative. Or write to Acme Steel Products Division, Dept. IA-123, Acme Steel Company, 2840 Archer Ave., Chicago 8, Illinois.

ACHE STIEL CO. CINCAGO

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STRAP IT ... STITCH IT ... SHIP IT ... SAFELY!

ACME STEEL





PRODUCTION UNITS

BUILT FOR

Nitriding Cyaniding Sintering Carburizing Annealing Hardening Melting Brazing Drawing Billet Heating Metal Coating Malleablizing Ore Smelting Salt Baths Soaking Pits Forging Core Baking Mold Baking Drying Electric or **Fuel Fired**



for military production ...

Whatever your heat process problems in plant conversion for military production, CONTINENTAL has the answer.

CONTINENTAL jobs begin with analysis of the requirements, then the selection and development of proper methods for greatest results. Finally follows the design, the building, and installation of the equipment including necessary workhandling accessories and control devices—delivering a COMPLETE UNITIZED PRODUCING PACKAGE with results guaranteed.

The broad experience of Conti-NENTAL offers you a prompt, sure solution to your change-over program.

CONTINENTAL INDUSTRIAL ENGINEERS, INC. 176 W. Adams Street, Chicago 3, Illinois

District Representatives:

Ridgewood, N. J. • Indianapolis • St. Louis • Detroit Cincinnati • Milwaukee • Cleveland • Pittsburgh

PLANNED MILITARY PRODUCTION
Write for Booklet No. 127

FURNACES
PRODUCTION LINES



SPECIAL MACHINES

MANUFACTURERS-ENGINEERS-CONTRACTORS FOR OVER A QUARTER OF A CENTURY

-New Equipment

Continued

Conveyor belt cleaning

This drive assembly plan for mounting Fullergript conveyor-best cleaning brushes eliminates the need for a separate power unit by tapping the conveyor head pulley. A counter shaft, mounted across the conveyor supports, is chain-



driven at one end by the head pulley while the other end is connected by chain drive to the brush. Brush speed is varied by changing the diameter of any four pulleys. Efficient conveyor cleaning depends upon a minimum 4:1 ratio of the peripheral brush speed to that of the conveyor belt. Fuller Brush Co. For more data circle No. 27 on postcard, p. 181.

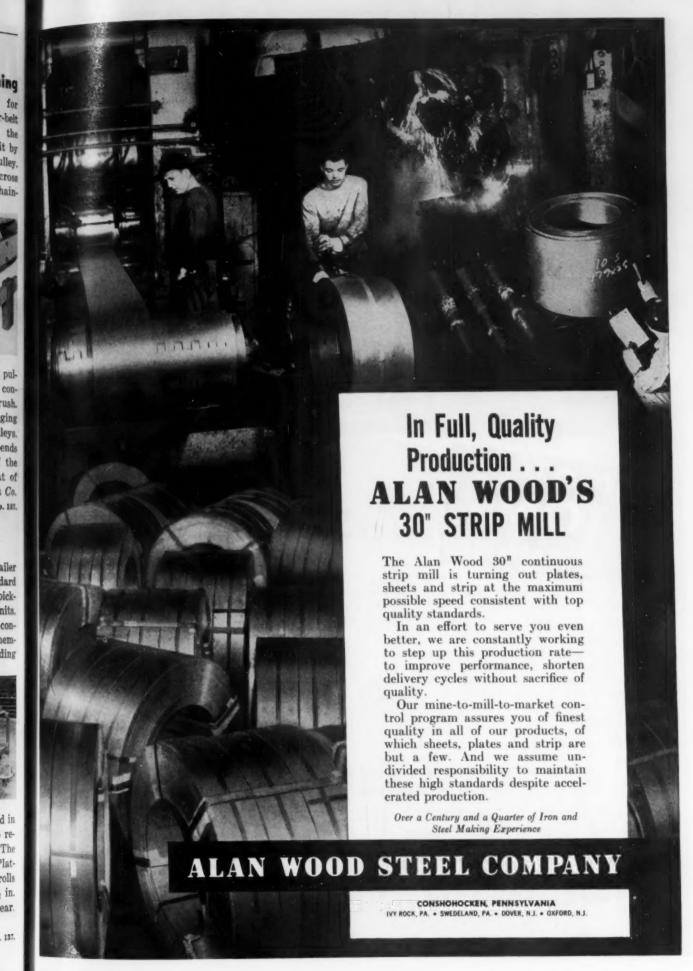
Roller top trailer

New roller top, caster steel trailer was designed to fit into standard conveyor lines to permit the pick-up and transfer of packaged units. Cartons or cases coming down conveyor line automatically load themselves onto the trailer by riding



over the rollers. They are locked in proper position when brakes to retain the rollers are applied. The trailer has 3000 lb capacity. Platform is 49×72 in. The unit rolls on rubber tired wheels: $8 \times 2\frac{1}{2}$ in. on the front, 10×3 in. on the rear. Mercury Mfg. Co.

For more data circle No. 28 on postcard, p. 137. Turn Page



December 3, 1953

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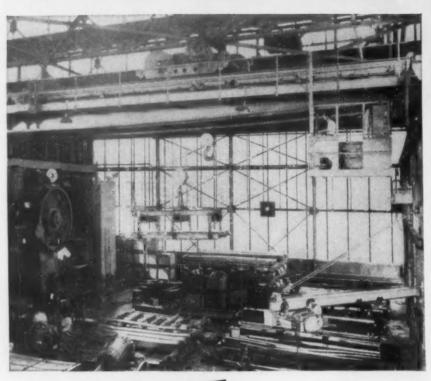
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CE

SHEPARD NILES CRANE



MOVES TONS of material with EASE...

With this Shepard Niles Crane, one man can move tons of material simply by flicking a switch. There's no wasted manpower, no floor or yard space lost—goods move swiftly by the most direct route.

It's easy to see why so many plants prefer low-cost throughthe-air handling. But which crane is best for your use? Talk over this problem with the Shepard Niles representative—he's a specialist in loads through-the-air. Write today for Bulletin describing Shepard Niles Cranes—and ask to have a representative call.

CRANES

Overhead: Top Running, Inner Running, Under Running, Floor or Cab Operated. Cap. 1 to 450 Tons.



1429 SCHUYLER AVENUE, MONTOUR FALLS, N.Y.

-New Equipment

Continued

Noise silencers

Two new series of silencers for quieting the noise produced by air compressors, blowers, vacuum pumps and other machines expelling high velocity air to atmosphere are designed for operation under moisture-free air conditions and for temperatures up to 200°F. Both are absorption type silencers em. ploying straight-through acoustically transparent perforated tubes surrounded by a deep layer of special, highly efficient, sound absorbing material, and feature minimum restriction to air flow. Series CA is for pipe sizes up to 6 in., LCA series for sizes larger than 6 in. Burgess-Manning Co.

For more data circle No. 29 on postcard, p. 187,

Semi-automatic mill

Greater production claimed for a new semi-automatic mill is achieved by the principle of rapid approach, infinitely adjustable cutting speeds, and automatic return. The large diameter spindle is supplied with a



choice of 3 spindle bores: No. 9 B&S, No. 10 B&S or No. 4 Morse taper. It is equipped with large Timken bearing and has 15 spindle speeds. Two or 3-slot table is available. T slots are milled from solid. All models are equipped with Bellows air feed and hydro check units. Rotex Punch Co.

For more data circle No. 30 on postcard, p. 137.

Turn Page

PRECISION FINISH THAT WITHSTANDS PUNISHING PRESSURES

MIDVALE STEEL ROLLS

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AGE

Turbine and Generator Shafts

Hardened and **Ground Steel Rolls**

Corrosion and Heat **Resisting Castings**

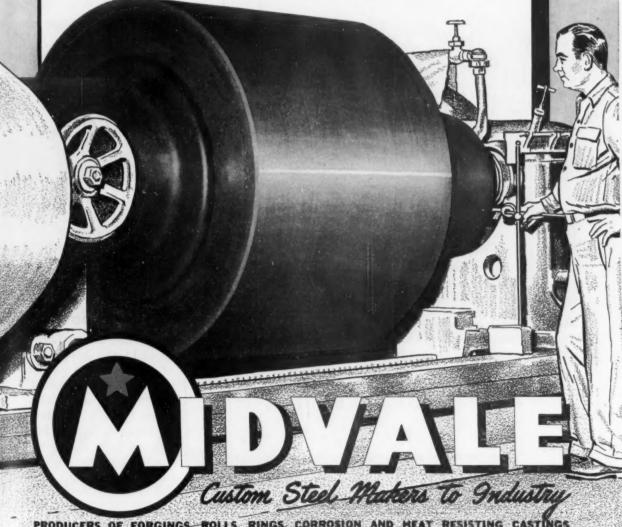
Ordnance and Armor

Rolls for tin plate, strip or sheet mills . . . precision rolling of copper, aluminum . . . or other metals . . . they are a specialty with Midvale. The years of experience and craftsmanship in making hardened and ground forged steel rolls -from furnace to finish grind-assures rolls unsurpassed in quality and performance.

If you need heavy steel equipment of any type, look to Midvale for the finest craftsmanship. Rolls for steel mills . . . roll shells for the mining and cement industry . . . pressure vessels for chemical and petroleum industries . . . rings for turbines and gears . . . Midvale makes them all to your most exacting specifications.

THE MIDVALE COMPANY

NICETOWN, PHILADELPHIA 40, PA. OFFICES: NEW YORK . CHICAGO . PITTSBURGH WASHINGTON . CLEVELAND . SAN FRANCISCO

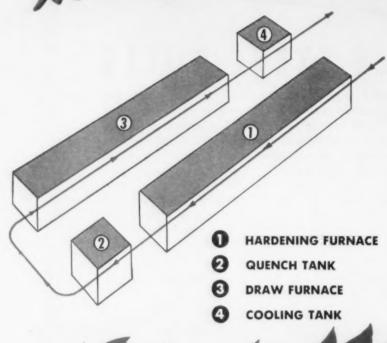


PRODUCERS OF FORGINGS, ROLLS, RINGS, CORROSION AND HEAT RESISTING CASTINGS

December 3, 1953

151

by Holoroff...4th of a Series



Automatic Heat Treating Speeds Forging Production

Holcroft developed this automatic furnace unit in order to heat, quench and temper automotive crankshaft forgings.

It consists of a gas-fired hardening furnace, a quench tank, a draw furnace and a cooling tank. So automatic is the production, that a two-man team can handle the entire operation. As a result, the unit contributes materially to trimming production time to a third or even a half of that required by previous methods.

Now, it's entirely possible that this unit costs a little more to install. BUT-a close examination of the cost records indicate savings after savings after savings. Just simple arithmetic proves the economy of a "little more costly" Holcroft furnace. Write today for details. Holcroft & Company, 6545 Epworth Blvd., Detroit 10, Michigan.



PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

CLEVELAND IS

New Equipment.

Continued

Cutoff wheel

Longer life is the main feature of an improved reinforced, resinoid hub-type cutoff wheel, known as the BFR wheel. Tests show that increased life of up to a third more than the former wheel can be expected with the same quality of cut. These durable wheels tend toward a better uniformity in grinding action wheel to wheel and lot to lot. The BFR wheel shows practically no tendency to fray or split at the face layers. Norton Co. For more data circle No. 31 on postcard, p. 137.

Tape dispenser

New Roll-on-Sealer is a tape dispenser that moistens and applies tape directly to cartons. Every sec. tion of a plant can be a potential packing room since the device can be carried anywhere to seal the cartons. The dispenser weighs only



21/2 lb before loading. It measures the tape as it is applied to the carton. Roll-on-Sealer is adjustable for tape up to 3 in.; operates equally well on light or heavy tape. Roll-On-Sealer Co.

For more data circle No. 32 on postcard, p. 137,

Greaseproof wrap

All grades of Induwrap greaseproof barrier paper for wrapping of slushed metal parts now meet stricter requirements of Military Specification Jan-B-121, Amendments 1 and 2. Original Grade A Induwrap is acetate laminated to red kraft by a neutral adhesive. Heavy-duty Type I will be acetatebacked to 60 lb red neutral kraft, similar to single ply medium-duty, Type II Induwrap. Angier Corp.

For more data circle No. 33 on postcard, p. 187. Turn Page



In the use of stainless steel, the selection of gauge number is usually determined by the minimum permissible thickness having sufficient strength to meet the requirements of the application. When you receive material on the heavy side of the gauge you are paying a premium for stainless surface area.

When sheets are ordered by gauge number, the permissible A. I. S. I. variation in thickness is plus or minus 10%. Thus, if you order 18 gauge, you may receive sheets .052" thick, when a thickness of .0475" would suit your purpose. Using a standard 18 gauge 36" x 120" sheet as an example,

the theoretical weight is 63.00 pounds, but this weight could permissibly vary between 59.22 pounds and 65.52 pounds. Each .001" of thickness adds 1.26 pounds per sheet.

MicroRold sheets may be ordered by gauge number and you can specify they be rolled on the light side of the gauge range. This is true because the equipment is such that more accurate control of thickness is possible.

If you are not a user of MicroRold sheet it will pay you to get the full details. Your steel warehouse distributor will gladly tell you the MicroRold story.

Washington Steel CARPORATION WASHINGTON, PENNSYLVANIA

December 3, 1953

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AGE



-New Equipment

Continued

Electric motors

A new line of electric motors in open drip-proof, totally-enclosed fan-cooled and explosion-proof enclosures in ratings up to 40 hp at 3600 rpm are built to new NEMA frame size standards. Modern styling, improved ventilation, greater protection, a new conduit box arrangement, new bearing construction, and more versatile mounting are the features. The new line packs more horsepower into a smaller, more functional package. Louis Allis Co.

For more data circle No. 34 on postcard, p. 137,

Lens cleaning station

New heavy-duty lens cleaning station consists of cleaning fluid and wiping sheets. The cleaning fluid includes anti-fogging properties, is packed in a pressure-packed can, and provides 1400 applications per



can. The can is locked to the steel dispenser which feeds interfolded wiping sheets one-by-one. Ample space for waste tissue is contained in the dispenser. Silicone Paper Co. of America, Inc.

For more data circle No. 35 on postcard, p. 137.

Liquid stainless steel

With Proco's new coating, liquid stainless steel, any base material may be quickly coated by brush or spray with actual stainless steel and be made permanently waterproof and chemical proof. It dries to form a tough, continuous, anticorrosive protective coating; gives the true blue-gray finish of stainless steel in its natural color. A gallon is said to cover 300 to 400 sq ft. Protective Coatings, Inc.

For more data circle No. 36 on postcard. p. 137.

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SALUTES

Merritt A. Hyde

His company awarded its highest honor to this authority on pipeline, industrial electrification.



THE engineering skill of Merritt Hyde is behind the electrification of many thousands of miles of oil pipeline in this country and abroad. Few such lines of any significance in the last decade have not felt the touch of this soft-spoken Westinghouse engineer.

Merritt was active in electrification of the famous "Big Inch" and "Little Big Inch" pipelines. He was an electrical consultant on the Trans-Arabian pipeline and the 1260-mile Plantation Pipe Line from Baton Rouge across the southeastern states. He has made many contributions to pipelines and refineries.

Before getting into the oil and chemical fields for Westinghouse, he had established himself as an authority on electrification of cement mills. He did quite a job, too, in construction-industry applications of electricity.

In recognition of his outstanding work, Westinghouse recently presented Merritt with the company's highest honor, the Westinghouse Order of Merit. In addition to recognition of his work in the oil industry, he was cited for contributions to industrial electrification, engineering literature, patent art, and the training of young engineers.

Since he travels so extensively, Merritt combines his hobby of color photography with his work. He has a library of some 6000 slides covering scenes throughout the U. S., Canada, Mexico, Central America, Western Europe, and the Middle East.

They're our babies

Here—in a baby's crib—we find just one more example of the wide diversity of Wickwire production... proof of Wickwire's ability to provide you with a single, dependable source of supply for every type of wire you may need in the manufacture of your particular product.

No less than nine different kinds of wire go into the making of a typical baby's crib. And every one of them is a product of Wickwire—the result of painstaking fabrication and quality control that's complete and uninterrupted from ore to finished wire.

Yes, whatever your specifications may be—high or low carbon, in all tempers, finishes and grades—For The Wire You Require; Check First With Wickwire.

Flat Wire for Extra Clean Bright Basic Hard Drawn MB Spring Wire mattress spring clips for border wire Bright Basic Link Wire for spring fabric Bright Basic Wire for adjusting rod-Gamma Spring Wire for mattress coils Bright Basic or Hard Drawn MB Spring Wire for locking device Hard Drawn MB Spring Gamma Spring Wire Wire for rod spring for helical springs

THE COLORADO FUEL AND IRON CORPORATION—Denver & Oakland
WICKWIRE SPENCER STEEL DIVISION — Atlanta • Boston • Buffalo
Chicago • Detroit • New Orleans • New York • Philadelphia

WICKWIRE WIRE

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THE COLORADO FREE AND THOSE CORPORATION

THE IRON AGE

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the Iron Age

INTRODUCES

Robert Shattuck, promoted to president, Marbon Corp., Gary, Ind., subsidiary of BORG-WARNER CORP.

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Dave R. Jones, elected president, THE GEOMETRIC STAMPING CO., Cleveland; and E. F. Carney, elected vice-president and general manager.

Roy D. King, elected vice-president in charge of railroad sales and development; MAGNUS CHEMICAL CO., INC.; and Marcel Zinty, elected vicepresident and general manager of the Equipment Div.

Ellsworth M. Smith, named vicepresident and chief metallurgist, PENN PRECISION PRODUCTS, INC., Reading, Pa.

Charles C. Cheyney, elected vicepresident of sales and engineering, BUFFALO FORGE CO., Buffalo.

Joseph Abusamra, appointed vicepresident and general manager, BELCHER MALLEABLE IRON CO., Easton, Mass.

Robert W. Emerick, appointed director of public relations, Pontiac Motor Div., GENERAL MOTORS CORP., Pontiac, Mich.

Carleton Ellis, Jr., appointed director of sales for all Plaskon products, ALLIED CHEMICALS & DYE CORP.

Dr. Paul Fugassi, appointed director of the Coal Research Laboratory, CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh.

Edward G. Holtzman, elected assistant secretary and assistant treasurer, WAGNER ELECTRIC CORP., St. Louis.

Carl Gustafson, appointed director of mechanical maintenance, COLOR-ADO FUEL & IRON CORP., New York.

Kenneth L. Walker, appointed superintendent, FOSTER WHEELER CORP. new plant at Mountaintop, Pa.

Walter F. Schultz, promoted to Cleveland regional engineer, LAM-SON CORP., Syracuse, N. Y.

R. M. Smith, promoted to assistant chief engineer, Engineering Dept., CATERPILLAR TRACTOR CO., Joliet, Ill. plant.

C. D. Clawson, becomes head of Ferro Powdered Metals, Inc., Salem, Ind., new subsidiary of FERRO CORP., Cleveland; and Charles B. Hughes, becomes vice-president and general manager.

A. G. Bissell, appointed a consultant, METAL & THERMIT CORP., New York.

Felix W. Saco, promoted to development engineer, THE PERMUTIT CO., New York.

H. B. Van Auken, becomes assistant to the chief engineer, LEMPCO PRODUCTS, INC., Bedford, Ohio; and Frank Vasarhely, appointed chief tool engineer.

George O. Bohrer, named chief engineer, MAGNESIUM CO. OF AMERICA, East Chicago, Ind.; and C. Ridgely Kemp, appointed vice-president in charge of research and development.

F. Alan Tiarks, named product manager, Cofar Div., Granco Steel Products Co., wholly-owned subsidiary of GRANITE CITY STEEL CO., Granite City, Ill.



JOHN M. MORRIS, appointed director of purchasing, Lone Star Steel Co., Lone Star, Tex.



JAMES T. MAUNDERS, named director of public relations, Bohn Aluminum & Brass Corp.



HENRY E. LEONARD, appointed manager of Advertising and Market Development Div., Isthmian Steamship Co., U. S. Steel Corp.'s subsidiary.

1958

GE

C. A. Fike, appointed manager of manufacturing, Cleveland, Ohio, plant, WESTINGHOUSE ELECTRIC CORP., Pittsburgh; and L. M. Walker, appointed manager of the industrial apparatus section, Agency and Construction Dept.

Hunter Dietz, appointed manager newly established Mattoon Div., GAR WOOD INDUSTRIES, INC., Wayne, Mich.

Frank F. Mulkey, appointed manager, St. Louis office, THE FALK CORP., Milwaukee, Wis. He succeeds the late Fitch Bosworth.

Herman Kramer, transferred to special assignment duties, SERVEL, INC., Evansville, Ind.; E. G. Schiff, becomes manager of civilian production; and John Davidson, is now manager of all defense production operations.

WILL THISAN LIBRARIES

Fred E. Greger, named sales manager, Standard Works Div., BALD-WIN-LIMA-HAMILTON CORP., Philadelphia.

Richard L. Allen, appointed general sales manager, BRIDGEPORT BRASS CO., Bridgeport, Conn. He succeeds the late Chester M. Adams.

A. M. Miers, appointed manager of design division, Engineering Dept., Pullman Car Works, Chicago, PULL-MAN-STANDARD CAR MFG. CO.

Warren E. Milner, appointed works manager, AC Spark Plug Div., GEN-ERAL MOTORS CORP., and Hubert L. Curtis, named manufacturing manager.

Ernie Fargo, appointed general sales manager, CLEVELAND IN-DUSTRIAL TOOL CO., INC., Cleveland.

F. Q. Wilson, appointed New York district manager, ELLIOTT CO., Jeannette, Pa.



JOSEPH W. POWELL, JR., elected vice-president for finance, Harris-Seybold Co., Cleveland.



F. H. WEHRHEIM, elected vicepresident in charge of sales, Appleton Electric Co.



WAYNE F. STRONG, elected vicepresident in charge of manufacturing, Iron Fireman Mfg. Co., Cleveland.



FRANK A. ROBERTS, named manager, Organization Planning, The Youngstown Sheet & Tube Co.



Millions of tons
of boron steels
prove the efficiency
and economy
of Vancoram

GRAINAL ALLOYS

Vancoram GRAINAL Alloys have been used to produce millions of tons of boron steels—and demand for these multiple element alloys is still growing. Here's why...

GRAINAL Alloys have proved invaluable in defense production, and are equally important in the making of steels for peacetime uses. They replace costly elements with respect to hardenability and other properties. They accomplish this through tailor-made composition that removes the element of chance from the steelmaking process. That's why the vast majority of all boron steels made today are made with GRAINAL Alloys.

Second, in stainless steels, small additions of Grainal Alloys improve hot working

characteristics, cut conditioning costs, increase output—pointing the way to another major GRAINAL application.

As part of its long-range program for keeping in step with America's expanding metals industries, Vanadium Corporation has installed at its new plant at Cambridge, Ohio, additional facilities for the production of GRAINAL Alloys.

For complete information on GRAINAL Alloys and other Vancoram products, contact your nearest Vanadium Corporation representative.



Producers of alloys, metals and chemicals

Vanadium Corporation of America

420 Lexington Avenue, New York 17, N.Y.

Detroit • Chicago • Pittsburgh • Cleveland

Write today for this new booklet on economical GRAINAL Alloys and their application.





CLEVELAND Top Quality High Carbon Heat Treated Cap Screws

It's easy to select hex head cap screws when you know that one type, which costs very little more than the general run, has all the desirable qualities recommended by metallurgists and engineers. Cleveland High Carbon Heat Treated Cap Screws made by the Kaufman Process—the Double Extrusion method—"come through" with all the important points experts look for in correctly made fasteners.

Cleveland specializes in Cap Screws (all standard heads), Set Screws and Milled Studs, in unusually wide size ranges.

*Licensed under U. S. Patent No. 2543705.

CLEVELAND Top Quality FASTENERS

THE CLEVELAND CAP SCREW COMPANY
2937 East 79th Street, Cleveland 4, Ohlo
originators of the Kaufman DOUBLE RIRUSION Process

-Personnel

Continued

Kenneth G. Patrick, appointed manager of educational relations services, Public Relations Services Div., GEN.
ERAL ELECTRIC CO., Schenectady;
J. Stanford Smith, named manager of general public relations services; and Ralston B. Reid, named manager of advertising and sales promotion, Apparatus Sales Div.

A. T. Peters, named plant manager, Bay City Div., THE DOW CHEMI-CAL CO., Midland, Mich.

J. T. Connell, appointed contract manager, Marine Repair Dept., Engineering Works Div., DRAVO CORP., Pittsburgh.

George F. McDonald and V. J. Hornak, join the sales staff, Los Angeles office, L. B. FOSTER CO.

H. W. Petty, appointed exclusive sales representative, western portion of Pennsylvania, THE STANDARD TRANSFORMER CO., Warren, Ohio.

Ernest F. Weeks, appointed sales representative, San Francisco area, REYNOLDS METALS CO.

Sydney E. Gregory, appointed Illinois and Indiana sales representative, ALLOY PRECISION CASTINGS CO.

John F. Lampe, joins Machine Tool Div. as representative in Eastern Pennsylvania and Southern New Jersey areas, KURT ORBAN CO., INC., New York.

Thornton Q. Raney, appointed eastern representative, WHITFIELD CHEMICAL CO., Detroit.

Fred B. Johnson, appointed western sales representative, CAINE STEEL CO., St. Louis.

OBITUARIES

Glen H. Matthews, 62, sales manager of metalworking machinery, Mattison Machine Works, Rockford, Ill., after a short illness.

Andrew H. Kean, 66, former sales representative, Edward A. Lynch Machinery Co., Wynnewood, Pa., after a brief illness.

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- ◆ You can matkedly improve bending properties of some titanium strip by removing a thin layer of surface metal, a study by Kennecott Copper has found . . . Embrittlement resulting from oxygen and nitrogen absorption during annealing or hot rolling impair titanium's bend properties . . . Stock removal restores those properties.
- ◆ Generally improved ductility results whether the metal is removed by grinding or pickling... But pickling offers an effective means of removing a thin layer of metal... Good bend properties are reported for 0.021 to 0.083 in. gage titanium strip from which an 0.001-in. layer has been removed from each side.

How To Improve BENDING PROPERTIES of Titanium Strip



By W. M. Baldwin, Jr.
Research Professor
Case Institute of Technology
Cleveland

♦ BENDING PROPERTIES of titanium strip can be sharply improved by removing a few thousandths of an inch of surface metal which has become embrittled in annealing or hot rolling. Pickling in acid has been found to be an effective method of removing from 0.001 to 0.002 in. per side of metal, although bend properties are also improved where surface metal is ground off.

Fabricators of zinc and magnesium, metals allied to titanium (all have a hexagonal close packed unit cell) have known that rolling produces a thin skin of metal having a preferred orientation unfavorable to bending. Removal of a sharply oriented surface layer, however, will increase the bendability of magnesium sheet. Frequently material with low tensile ductility can give lower permissible bend radii than material of higher tensile ductility. Similarly, in rolled zinc alloy, a striking improvement in bending quality is attained when surface layers are etched away.

Rolled surfaces of titanium might be expected to acquire similar orientations unfavorable to bending properties. Moreover, because titanium readily absorbs oxygen and nitrogen at high temperatures, these same surface layers could become embrittled during air annealing or hot rolling. Rapid deterioration in bending properties of titanium strip when annealed in air, Fig. 1, has been reported.³

Pickling offers a practical means of improving bend properties in titanium strip. Pickling titanium sheet in nitric-hydrofluoric acid has been found to reduce bending failures in aircraft construction. It would be useless, however, to pickle air-annealed titanium to remove

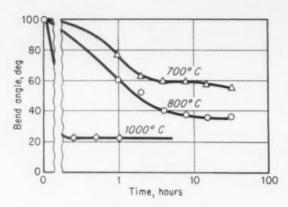


FIG. I—Deterioration of bend angle (around an IT radius) of titanium strip when annealed in air for various times and temperatures.

oxidized surface layers if poor orientation resulting from subsequent rolling were the real cause of poor bending properties. Studies made by Kennecott Copper Corp. aimed at clearing up these and other problems related to bending.

Experiments on titanium from a number of sources and on titanium produced to give low bending properties showed pickling in 10 pct hydrofluoric acid to be a generally effective method of improving bending properties, Fig. 2. Most spectacular improvement showed a jump in one case from a bend angle of 15° to 120°. Pickling also improved general ductility of the

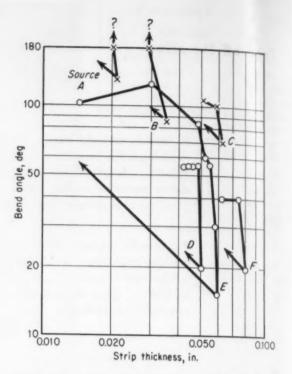


FIG. 2—Improvement in bend angle of titanium strip when pickled in 10 pct hydrofluoric acid. Unpickled strip is right hand point in each case.

strip. Depth readings in Olsen deep drawing tests, as well as contraction in area and elonga-

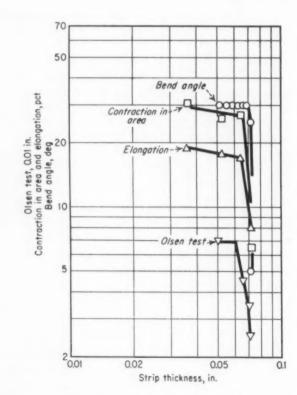


FIG. 3—Improvement of various ductility properties of titanium strip as a result of pickling.

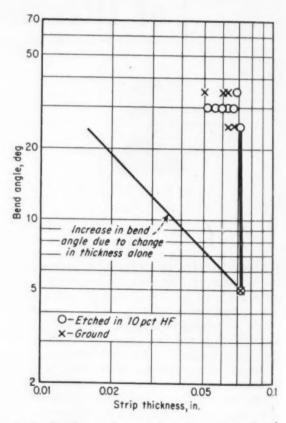


FIG. 4—Comparison of improvement in bend angles effected by surface removal methods.

tion measurements in tensile tests all increased on pickled strip, Fig. 3.

Experiments were conducted to determine causes for the improvement in ductility. Experiments with seyeral acids indicated that any acid which removed metal increased ductility of the metal. Both pickling and grinding were found equally effective, Fig. 4, in improving, ductility. All experiments lead to the same conclusion: Ductility of titanium strip is improved by removal of surface layers by any means.

Extensive x-ray studies were made of titanium strip rolled and annealed according to a variety of schedules to determine what undesirable features of the metal lie in the surface. These might be oxygen and/or nitrogen-saturated metal resulting from annealing, or an undesirable orientation of material as a result of rolling.

Under no conditions was an orientation found in the surface layers that differed greatly from orientation found in the interior. This discredited the idea that highly oriented surface layers were the major contributing factor in damaging bending properties.

Confirmation was found in an experiment in which titanium strip with poor bending properties was first ground to give good bending propties. Once the surface layer had been ground off, the material was rolled to a series of gages to introduce oriented layers if possible. The ma-

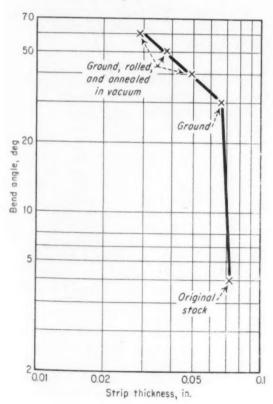


FIG. 5—Effect of alternate grinding and air annealing on the bend angle of titanium.

terial was then annealed to restore the metal to a soft temper and bent. Bend angles of these strips, Fig. 5, increased with decreasing gage directly from the improved ground value, rather than dropping to the lower level of the original unground stock. Once brittle surface layers are removed from titanium strip, rolling itself does not develop them again.

These experiments seemed to indicate that pickling improved bending properties because it removed oxygen and/or nitrogen-saturated surface layers. Positive proof was obtained in the following experiment. Samples of titanium strip were ground from 0.072 to 0.061 in. gage which upped bending properties from 5° to 30°. These specimens were annealed in air at 1520°F for 2 hours, coming out with an 0.001-in. oxide scale.

Anneal embrittled the strip

Representative samples gave bend angles of approximately 5° indicating the anneal embrittled the strip to virtually the same value as the original stock. Specimens were first ground to remove surface layers and then bent. Clearly air annealing embrittles titanium and subsequent surface removal restores ductility.

How much metal must be pickled off for full restoration of ductility cannot be answered unequivocally. Depth of pickle will depend upon severity of oxygen or nitrogen attack during hot rolling and annealing. On the average, for strip running between 0.021 and 0.083 in. gage, removal of 0.001 in. per side improved properties as much as they were going to be improved. A few strips required a pickle of 0.002 in. per side, and one strip even more.

Too much metal can be pickled off. Metal from source E, Fig. 2, showed a large drop-off in bend angle when pickled to 0.015 in. Whether this is due to hydrogen embrittlement or grain boundary attack is not known. Ductility properties, Figs. 1 and 2, are sharply improved by removal of a few thousandths of an inch of metal, but maintain a level figure with further pickling.

ACKNOWLEDGMENTS

The author wishes to thank H. P. Croft, Kennecott Copper Corp. and A. I. Blank, Chase Brass and Copper Co., Inc., for their criticism and help.

REFERENCES

- ¹G. Ansel, and J. O. Betterton, "The Hot and Cold Rolling of Magnesium-Base Alloys", Nonferrous Rolling Practice, Institute of Metals Division Symposium Series, Vol. 2, AIME, 1948, pp. 153-210.
- ² G. Edmunds, and M. S. Fuller, "Relation of Crystal Orientation to Bending Qualities of a Rolled Zinc Alloy", Transactions, A!ME, Vol. 99, 1932, pp. 175-189.
- ⁸ E. C. Knuth, "The Effects of Annealing on the Bending Properties of Titanium Strip", Case Institute of Technology.
- ⁴ F. R. Kostoch, "Titanium in Airframes", Transactions, SAE, 1953.

PRESSURE: Versatile Equipment Broadens Work Range

By John E. Hyler

Consultant John E. Hyler & Associates Peoria, III.

- ♦ Hydraulic presses handle a wide variety of assembly jobs by fitting, crimping, riveting, staking and other pressure methods . . . Assemblies are accurate, breakage is low and production high . . . In one riveting job, 18 rivets are headed simultaneously . . . In another, riveting and milling are done in the same press.
- ◆ One tough staking job has rejects of less than 1/2 pct . . . Eight flaring operations done at once assemble wardrobe hangers . . . Metal parts are crimped to ceramic and glass without breakage . . . Many parts are sometimes blanked, formed and assembled on an automatic machine in a single stroke.

Part II

♦ HYDRAULIC PRESSES of the relatively light but highly versatile type play an important part in pressure-assembly work. They can be controlled easily and their operation is smooth. With the aid of fixtures, these presses produce accurate work, increase production and hold rejects to a low figure. All of these factors have promoted their use in a wide variety of jobs including fitting, crimping, riveting, staking and other pressure-assembly operations.

Burnishing is an occasional adjunct of pressure-assembly work. An intricate special hydraulic assembly press is used for assembling motor armatures. Laminated parts making up the rotor are pressed into position and then ironed into permanent placement by burnishing pins. This particular press has a six-position hydraulic dial-feed table where armatures are

assembled at the rate of 12 per minute. It exerts pressures of 20 and 30 tons by opposed rams.

Hydraulic presses are frequently used in making riveted assemblies. Many prefer this method because of its quietness. Some hydraulic riveting is done in vertical stationary presses. Other hydraulic riveters, which operate on the squeeze principle, can be suspended with bails from cranes or on spring-type balancers.

Many different riveting operations are performed on these presses. Silver rivets are often used for electrical contacts, and one of the jobs done by these presses is that of assembling the rivets to the contact bases.

Rivets are fed from a Detroit screwdriver hopper feed. As the hopper feed revolves, it picks up the rivets and delivers them into a chute with heads upward. A twist in the chute inverts them so that they load with the shank end up into one of six fixtures of an indexing table. Seven different types of contact bases are assembled with very little change in the tooling setup.

MR. HYLER brings to The Iron Age more than 20 years' experience in all phases of shop work. His studies and research have given him a broad practical knowledge of manufacturing problems.



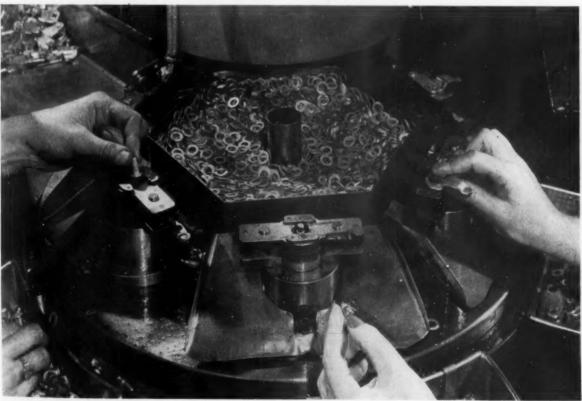
COMPACT LAYOUT in a pressure-assembly department, plus chutes and conveyors to move

Tiny rivets also hold together the two halves of many hall-bearing retainers or cages. Other retainers are assembled by clinching a formed lip on one half of the retainer over the other half. Assembling must be done with the balls in the retainers. Whether they are assembled

Courtesy of Denison Engineering Co. parts quickly, accounts for high production rate. Of the 13 presses, 11 have indexing tables.

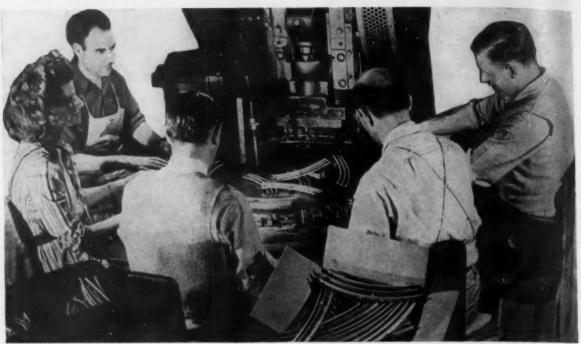
by riveting or clinching, the same general type of press is used. A six-station indexing table has six sets of dies which revolve with the table, but it has only one set of punches at the ram.

The bearings, with the two halves of the re-



STAKING OPERATION securely assembles two parts into a small subassembly for an automobile

Courtesy of Denison Engineering Co. door latch. Assembled parts are then fed to main line which produces about 750 latches per hour.



DIAL-FEED PRESS keeps five operators busy on assembling curved sections of track for model

Courtesy of E. W. Bliss Co. trains. Rotary table accommodates dies very well and allows operators enough working room.

tainer and the unheaded rivets in position, are placed on the dies in a position opposite from the press ram. The operator's hands need not be close to the press ram at any time. Retainers made by lip-bending and clinching are assembled in the same general manner, except that the dies are specially designed for the purpose.

Various other interesting riveting operations include pivot bearings of scissors-type auto jacks, riveting of square-shank screws into insulator bases, and multiple riveting of motorcycle wheel-sprocket and brake-hub assemblies. On the latter job, 18 rivets are headed simultaneously on a 35-ton, manually-controlled press. Misalignment of holes, which is accentuated where rivets are headed singly, is entirely eliminated.

Press uses milling attachments

An interesting aspect of this operation is the use of a special holding fixture. It is mounted on the press bed, but it pivots outward from the work area as it rotates. The sprocket and hub assembly can be placed in the inverted tooling without spilling any of the loosely inserted rivets. With the assembly in place, the holding fixture is turned to its normal position and swung into place beneath the press ram.

In another setup, a versatile press is fitted with milling attachments. Riveting and milling operations on contacts of a Bakelite rotor are combined. A six-position indexing table is also used for this work.

Parts are loaded at a position opposite the ram. The operator first loads the rotor in the

fixture, places a brass contact on a rivet molded in the plastic, then sets a spring-metal contact over the rivet. The assembly moves to the press ram where the riveting is done. The next index carries the riveted assembly to the first of two milling cutters for rough finishing of the brass contact. A second milling cutter finishes the job at the next station.

Double-heading of rivets is done with a similar press on artery clips. The same press blanks the clip halves from sheet stock. Riveting is a three-operation process. The first operation rivets one half. The other clip half is added in the second stage. The two are then riveted together to complete the part. Rivet heads are rounded off for better appearance.

Staking is closely akin to riveting. Tubing can be attached to the perpendicular surface of a part by staking. In one case, a short length of brass tubing is staked into a serrated hole in a steel housing to form a support and tube assembly for a phonograph pickup arm.

Some tough problems were encountered in this staking job. The brass tube had to fit tightly in the serrated hole, and any slight movement under a torque test would be sufficient cause for rejection. The upper edge of the brass tube had to be forced into the serrations to completely fill them. In spite of this, the job was accomplished with a rejection rate of less than ½ pct.

On jobs of a less critical nature, tubes can be flared at the ends in assembling them to holes to form sufficiently tight fits. This is done in making wardrobe hangers where a number of short tubes act as pivots for arms. Four tubes. located in a line, are flared simultaneously at both ends. Four punches located in special holding fixtures and another four punches in a tool held by the press ram perform all eight flaring operations simultaneously.

Among other staking jobs is one on small counter wheels used in automatic voting machines. These wheels are made of four parts which must be staked with great accuracy. In another job, a six-part magnetic swtch assembly is made by staking the contacts, terminals and a permanent magnet to a Bakelite base in a single press operation.

In the latter operation, two punches are mounted in an unusual equalizer head filled with beeswax. This arrangement assures equal distribution of pressure between the two staking points. In addition, the press operates on a pressure-reversal principle, at a 1½-ton pressure. The makes the pressure at each staking point of an assembly precisely the same even though the bases may vary in thickness. Breakage and loose staking are thereby eliminated.

Dial-feed presses for assembly

Metal pins are frequently staked to stamped plates in making various types of assemblies. If parts are designed for staking, suitable fixtures can be designed to hold and support the parts in the press.

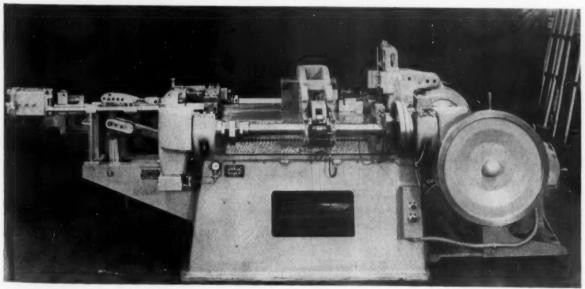
Dial-feed presses are well suited for assembling parts having an arc. A rotary indexing table accommodates the dies and permits a number of operators to be stationed around it. With operators working at the various stations other than where the ram descends, complex parts can be assembled without difficulty.

Many press operations involve crimping of sheet metal. In one job, thin metal electrode tubes are crimped to ceramic insulators. Crimping dies are split type, closed by a cam. In another crimping operation, brass and steel ferrules are secured to glass doorknobs on presses equipped with pressure reversal. Such presses must exert just enough pressure to avoid breaking the knob. A small flat felt or paper knob is first glued to the base of the knob which is then pressed into a slotted metal part in the cup of the ferrule. This pad overcomes slippage between the ferrule and knob.

Filters with two fine-mesh wire disks are assembled into a single unit by means of a brass grommet. Both disks are the same diameter. One is a 200-mesh screen of 0.0023-in. diam phosphor bronze wire. The other is 300-cesh screen of 0.011-in. diam brass wire. The bronze screen is placed over the grommet and the brass screen is added. The assembly is fed through a trough, by hand, to a dial-feed multiple-station table. At the first station, the grommet is partially crimped. It is then indexed to the second station for final crimping.

Timed dies of progressive type, together with auxiliary mechanisms, can be made for the press although their cost would be relatively higher. With them, two or more parts may be stamped, assembled, and ejected in one press operation. Such jobs can be done with two progressive dies, with two pieces of strip stock feeding toward the center of the press from two sides. While this is mechanically practical, it is economically impractical except on extremely long runs of assembled parts.

Multi-Slide machines with proper tooling are sometimes used for the same purpose. These machines are built primarily for automatic production of precision formed stampings from coil stock. In some cases where the end product is an assembly of many parts, the parts can be made and assembled on one machine. Savings are substantial where this can be done on assemblies made in large volume.



MULTI-SLIDE machines are frequently used for stamping and assembling precision-formed parts

Courtesy of U. S. Tool Co., Inc. in a single press stroke. If parts are suitably designed, savings are substantial.

Abrasion Resistant Coatings

SPRAYED On Metal Surfaces



By W. G. Patton
Asst. Technical Editor

♦ WEAR-RESISTANT COATINGS are being applied to wear parts made of low-carbon steel by an unusual method at Wall Colmonoy Corp., Detroit. With a two-pistol setup, a powdered nickel-base alloy is sprayed over pump plunger surfaces to give low-friction, longer-wearing properties which will stand up under tough service conditions. By use of the Sprayweld process, costs for maintenance and materials have been cut sharply.

The 44-in. long by 4½ in. diam plungers are used in horizontal hydraulic pumps which supply water at a pressure of 2000 psi for an Army Ordnance tube mill. Because these pumps handle river water, the plungers are subjected to severe abrasive action from dirt, grit and mill scale. They are also subject to some corrosion.

Save plenty on maintenance

Uncoated pump parts score almost immediately in this application. Plungers wearproofed by chrome plating, or coated by spraying conventional alloys, score immediately and require repacking from six to eight times a day when kept in service.

Plungers which have been wearproofed with the fusion-bonded, low-friction, nickel-base alloy coating have been in operation for a year and a half. During this time, they have been repacked only twice, resulting in a saving of \$600 in

- ◆ Low-carbon steel plungers used in pumps supplying river water laden with grit, dirt and mill scale have lasted 1½ years without appreciable wear... Credit goes to a wear resistant surface which can be sprayed on... Previously, plungers scored almost immediately and required packing six to eight times a day.
- ◆ Wearproofing is applied by the Colmonoy Sprayweld process . . . It sprays a powdered nickel-base alloy onto the plunger surface to provide a low-friction wear-resistant coating . . . Oxyacetylene heating, after spraying, fusion-bonds the coating and makes it nonporous.



GRIT BLASTING prepares pump plunger surface for better mechanical bond between wearproof alloy coating and low-carbon steel base metal. Plunger has been drilled to speed heating.

maintenance time and materials. No evidence of scoring is yet noted.

To apply the No. 6 alloy coating by the Colmonov Sprayweld process, a plunger is drilled with a 2-in. diam drill to a depth of 38 in. Removal of this metal speeds the heating process which follows application of the alloy coating.

Grit blasting prepares surface

The outside surface is then prepared for subsequent alloy spraying by processing it through a grit blasting machine. In this step, the surface is roughened by blasting with SAE 18 steel grit. Thus, the surface is in better condition to provide a good mechanical bond between the base metal and sprayed-on alloy coating.

A slower but satisfactory method of obtaining a roughened plunger surface has been to chuck the part in an engine lathe and turn the outside diameter using a pointed tool with the lathe feed set at about 40 threads per inch.

Following the grit blasting step, the plunger is chucked in a lathe for the two-pistol metal spraying operation. In this setup, a panel mounting the apparatus is on a stand in back of the operator. It includes the Sprayweld powder hopper, carburetor, regulator and hoses for the air supply, and those for oxygen and acetylene. Air is supplied from the factory lines at a pressure of 60 psi and a flow rate of 15 cfm.

Two pistols, connected to this panel by hoses, are mounted at angles to each other in the lathe tool post. To apply the wearproofing alloy, the lathe carriage moves the pistols back and forth along the length of the plunger until a 0.025-in. thick coating has been applied.

Ordinarily, sprayed metal coatings are porous and have only a mechanical bond to the base metal. This mechanical bond may fail in severe applications like pump plungers. Porosity of the coating cannot be tolerated where corrosion resistance of pump components is required.

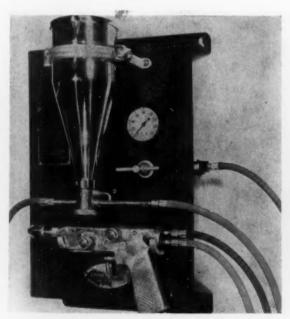
To provide a fusion-bonded, nonporous alloy coating, the plunger is left in the engine lathe and two oxyacetylene torches with multiflame heads are held one behind the other slightly below the plunger centerline. When the plunger surface temperature reaches 1900°F, the specially compounded alloy becomes plastic and bonds to the base metal. The alloy coating does not oxidize during this fusing process.

Following the fusing process, the outside diameter of the plunger is ground to size in a standard grinding machine equipped with an 80-grit wheel.

Alloy in powder form

The alloy, before it is applied to the plungers, is in powder form. It is a nickel-base alloy containing both chromium and boron and has a hardness of 56 to 61 Rc. The alloy is nonmagnetic, has a specific gravity of 7.80, and melts at 1900°F.

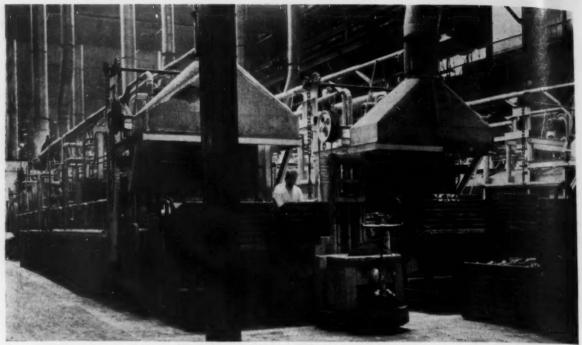
Among its physical properties are high resistance to abrasion, galling and corrosion. It also has good impact resistance and excellent red hardness. While in its plastic range from 1850° to 2050°F, it will bond to steels, stainless steels, some cast irons and some copper alloys without flowing or losing its shape. About 8 lb are required to wearproof the SAE 1020 steel plungers.



WORK PANEL of Sprayweld setup holds hopper for powdered alloy, an air regulator and a pistol. Coating operation requires two pistols. The gun uses factory air at pressure of 60 psi.



NICKEL-BASE alloy is sprayed onto surface of pump plunger as it rotates in an engine lathe. This wear resistant coating is applied by two pistols traveling on the lathe tool holder.



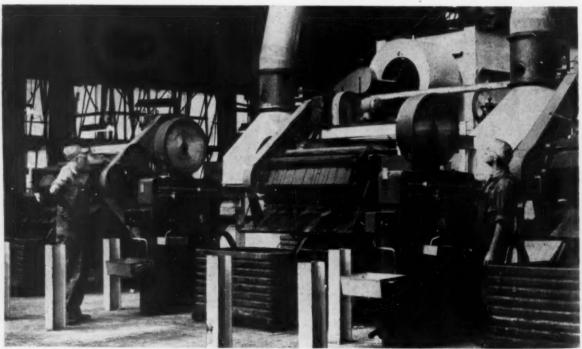
FEEDING END of Holcroft continuous gas fired furnace for heat treating track link forgings.

Faster and better-

Integrated Heat Treating and Machining Setup arco. Triples Production

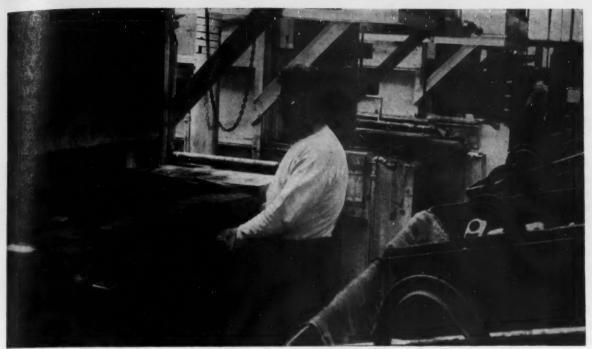


By A. A. Fisk
Assistant Works Metallurgist
Tractor Works
International Harvester Co.
Chicago



HARDENED AND TEMPERED forgings drop from discharge ends of three furnace lines into

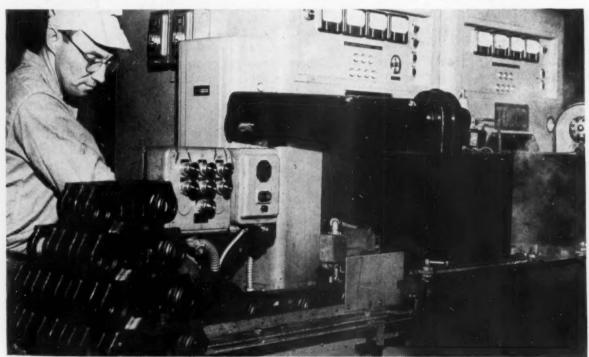
skid boxes. Boxes are on scales. Parts are weightcounted before broaching operation.



HARDENING FURNACES are loaded by hand across the width of the continuously moving hearth.

- ♦ Careful integration of heat treating and broaching operations has helped this Midwest manufacturer cut costs of parts made from forgings . . . Both production rates and quality have been improved.
- Modern heat treating facilities and improved methods played a big part in improving production ... Elimination of annealing and normalizing operations cut labor costs . . . Water quench used in the new setup has replaced an oil quench.
- ◆ INTEGRATION of three continuous furnaces and two induction units with a machining operation between has more than tripled production of finished forgings at the Tractor Works of International Harvester Co., Chicago. Quality has been improved and costs have been cut. The new setup allows use of a lower carbon steel and eliminates annealing and normalizing operations.

Production and heat-treating of links for tracks of crawler type tractors are processed in high volume at the company's plant. Each link



BROACHED FORGINGS are loaded in track which passes the parts through the coils of two

Tocco induction units. Top edge of link is hardened and tempered in one operation.

"Fuel feed is adjusted to yield the temperatures required, according to conveyor speed . . ."

is a forging that requires machining and must be hardened without significant distortion to meet severe service requirements.

Until recently, links were forged from C1070 steel, normalized at 1650°F and cycle-annealed at 1380°F for partial spheroidization. After machining the forgings were oil hardened from a pusher type gas fired furnace, by quenching in a conveyor equipped quench tank. The conveyor is timed to eject parts at a predetermined rate so as to reduce distortion. From the quench the links were carried by conveyor through a draw furnace at a temperature of 1000° to 1040°F and resulted in a hardness of 331 to 388 Bhn. No further machining was required but total hardening time was 5 hours or a rate of 3 links a minute.

To expedite heat treatment and to improve over-all production economy, link forgings are now made from 1045 steel and completely new heat-treating setups are employed. Three 3600-lb capacity Holcroft gas fired continuous furnace lines are now used for through hardening before machining. Sixteen 175-kva Tocco induction units are used for hardening of the wear surfaces. Loading in the continuous furnaces is done by hand from tote boxes. No further manual handling is performed except for hourly hardness checks on random forgings. The process is automatic through the draw furnaces. From the furnace the parts are dumped into tote boxes, weighed in bulk lots, and delivered to the broaching machines.

Quench temperature held constant

Initial heating to 1520°F is done rapidly in the Holcroft furnaces resulting in little scale. When up to temperature, the links are discharged into a water quench held at a constant temperature so that the forgings issue at 150° to 180°F. A conveyor carries them from the quench through a continuous gas fired Holcroft tempering furnace of the recirculating type.

The parts are tempered at 1100° to 1130°F and water quenched to a safe handling temperature. They are then elevated by a step conveyor and dumped into steel skid boxes on weighing scales. When the specified weight is in the box, operators stop the discharge momentarily until a new skid box can be put in place. Weighing affords a means of checking the number of forgings delivered to the machine shop.

Both heating and tempering furnaces are thermostatically controlled and fuel feed is adjusted to yield the temperatures required according to conveyor speed. Time from loading of heating furnaces to discharge from tempering furnaces is 180 minutes. Only one operator

is required for the handling of each furnace,

Loading of the heating furnace conveyor is done uniformly with the long dimension of the links parallel to the conveyor motion. As a result, links are discharged on end and quenching does not result in significant warpage. After tempering, parts have a hardness of 23 to 31 Rc and are ready to be broached.

Broaching is done in automatic horizontal Foote Burt machines. Loading is by hand into fixtures that clamp each link automatically and advance it continuously under the fixed high speed steel broaching tools. These make longitudinal cuts along each side and broach a slot in each link. After broaching, the fixture unlock automatically and the parts drop out of the fixtures into a tote box. A Hapman conveyor removes the chips made by the broach.

Lines function automatically

After broaching, the links are ready for localized hardening along one of the side surfaces just machined. This hardening is performed in two Tocco 175-kva induction heating machines. One machine is used for left and one for right links. Each line functions automatically except for the hand loading of the forgings into the track along which they are advanced continuously by a conveyor.

The top faces of the links pass in succession under each of two heating coils. Under the first or hardening coil, the top face is brought up to critical quenching temperature and spray quenched. Portions below the heated surface are kept cool by jets of water arranged to travel along with the conveyor. These jets spray given areas continuously as heating proceds but do not play on the surfaces to be hardened.

After passing the quench, the links are advanced under the second coil and the hardened surface is raised to draw temperature. After tempering, water sprays reduce the link temperature for safe handling and the links fall into tote boxes as they reach the ends of the tracks.

Case hardness checked hourly

A small exhaust blower draws off the steam produced at the heating coil and keeps the steam from cendensing on the surface of the coil. Depth of hardness is controlled by the conveyor speed and pressure of the quench water. Both of these are controlled to yield a case depth of about ½ in. Hardness of the case is checked hourly and is held at 50 to 60 Rc. This is about 27 points on the Rc scale above link hardness attained in initial heat-treatment.

With this conveyorized induction setup, the time per piece is slightly over 12 sec, or almost five links a minute. Thus, each line discharges 290 links an hour. There are two pairs of Tocco machines for each size of link and four sizes are produced. Despite this high production rate, a high degree of uniformity is attained.

IMPROVED CHUCK Speeds Machining of Brass Parts

- Reductions in machine-handling and work-handling times through use of an improved chucking device have substantially reduced overall time per piece in machining of many brass parts... Elbows, crosses, tees and similar parts requiring several successive operations can be machined more rapidly.
- Big gain comes in performing successive machining operations . . . Parts do not have to be removed from the chuck. Moreover, spindle does not have to be stopped . . . Less scrap and less damage to threads are secondary benefits . . . Work flow is improved.



By Dale Stoneman
Tool Engineer
The Warner & Swasey Co.
Cleveland.

♦ MANY BRASS SHOPS are setting new production records in machining of tee and elbow pieces through use of chucking equipment which substantially reduces overall machining and handling times for these parts. Because of the nature of these parts and customary lot size, machining of multiple-end pieces does not lend itself to completely automatic operation.

Machining times on these parts generally are brief, due to the high machinability of brass.



BRASS PIECES machined at the H. A. Thrush Co., Peru, Ind., are typical parts requiring sever-

al successive machining operations. Angular relationships must be held fairly closely.

In machining brass parts, only 20 pct of time was spent in metal cutting . . . Improved equipment helped raise this percentage . . .

Any substantial reduction in manufacturing costs must come from reductions in time consumed in secondary operations such as machine-handling and work-handling times.

In an effort to solve this problem, the Warner & Swasey Co. analyzed elements of time required in the machining of brass parts. The studies applied to lots ranging from 800 to 50,000—typical of ordinary production experience in brass shops. First results of these studies was development of the 16-in. Electro-Cycle turret lathe for machining of nonferrous metals.

Analysis had shown that in machining such brass parts on a turret lathe, over 80 pct of time used in the operation was consumed by work-handling and machine-handling. Less than 20 pct of time consumed was spent in cutting metal.

To increase production efficiency in machining nonferrous metals, methods were sought to reduce work-handling and machine-handling times. The problem of reducing machine-handling time was tackled first.

Where time was lost

Studies indicated the largest portion of machine-handling time was consumed in controlling spindle action: starting, stopping, reversing the spindle, and positioning the chuck for loading. To eliminate time lost here, a machine was designed to perform these functions automatically.

The Electro-Cycle turret lathe has an automatic spindle control actuated by the operating cycle of the hexagon turret. After presetting this control, complete automatic control of the headstock for any turret face is achieved, making it unnecessary for the operator to devote any time to spindle positioning, speed changes, starting, stopping and reversing the spindle. Manual operation of the headstock is eliminated.

Experience to date in brass plants where this lathe has been used indicates a sharp reduction in machine-handling time for the operator is possible. Further reductions in work-handling time on the part of the operator, especially with respect to elbows, crosses, or tees, which required several machining operations were then studied. Answer to this problem proved to be an air-operated, air-indexing 2-jaw chuck which could be used in conjunction with the Electro-Cycle lathe.

Standard method of machining a tee piece required three operations. The basic 2-jaw chuck did not permit rotation of the work without removing the piece from the machine. The

three ends of the tee piece were machined in successive operations.

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In addition to the time consumed in this triple successive machining, other factors contributed to higher costs. Increased handling increased the possibility of damaging threads. Successive chucking and rechucking increased the possibility of error in angular relationships from one cut and another. Delays on a three-step operation could retard the flow of work through the shop.

Solution to these problems was a 2-jaw chuck which would permit successive machining operations without removing the work. Various indexing chucks, hand or air-operated, were available. However, the spindle still had to be stopped before the operator could rotate the piece within the chuck. This difficulty was overcome with the air-operated, air-indexing 2-jaw chuck which could be used in conjunction with the Electro-Cycle turret lathe.

This chuck permits successive rotation of the work piece without stopping the spindle. This is accomplished by a special mechanism at the end of the spindle. Rotation of the work piece within the chuck is accomplished by operating either a foot or hand lever, depending upon the work to be performed and on operator convenience.

Some brass shop operations are set up on a possible 6-second machining cycle. Continuous



MACHINING AUTOMATIC valves on the Warner & Swasey 16-in. Electro-Cycle at the A. W. Cash Valve Mfg. Corp., Decatur, Ill. With new type chuck substantial production savings were possible.

operation of the spindle permits the greatest possible degree of continuous operation in a manually operated machine. The new chuck permits continuous spindle operation and minimizes machine-handling time.

Modern machine operation puts least emphasis on muscle and greatest emphasis on operator aptitude. This is especially true in high speed operations of the type required in brass shops. It is essential that the operator establish a satisfactory working rhythm. A rhythm which does not induce fatigue can be successfully maintained by the average operator throughout 8 hours. The exceptional operator, especially the man on an incentive basis, can easily surpass standard production norms.

Successful applications of the new chuck and the 16-in. Electro-Cycle turret lathe have been reported by several companies making plumbing and heating equipment and supplies. The variety of parts machined, and the wide range in lot sizes, indicate this combination can also be successfully applied in other production machining setups involving nonferrous metals.

A typical installation is that reported by the Hoffman Specialty Mfg. Corp., Indianapolis, manufacturers of plumbing and heating equipment. They were concerned with the cost of subcontracting thermostatic steam traps, which were of high quality brass casting, requiring machining of three ends. Lots ranged from 1500 to 90,000. Hoffman found the work could be done in its own plant at a substantial savings. In addition to savings in direct labor resulting from this lathe and chuck combination, the plant's management reported it at-

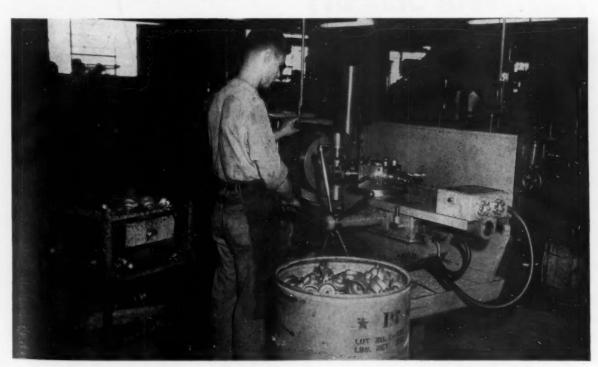
tained better control of quality. A smoother flow of production was possible and corrective operations formerly required to avoid nicking of the work were eliminated. Production increase averaged an estimated 50 pct on a single chucking operation.

The H. A. Thrust Co. of Peru, Ind., handles lots ranging from 10,000 to 25,000 pieces. Theirs is a seasonal problem, with production requirements higher during the early spring and summer months. Most parts are brass castings. They have a number of three-end and some four-end pieces, with fairly rigid tolerances as to angular relationships.

Production flow smoothed out

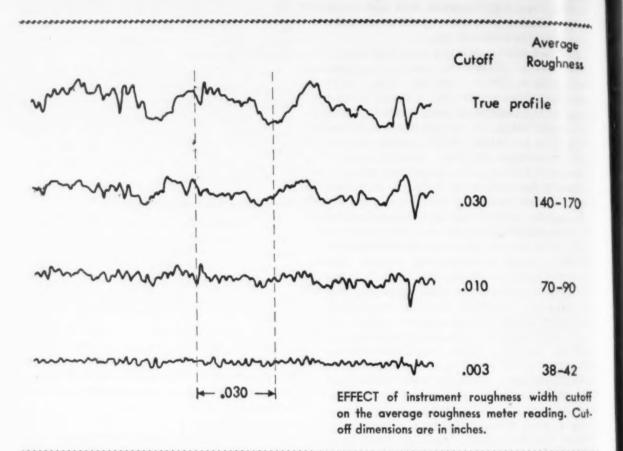
Use of this type chuck on a 16-in. Electro-Cycle has enabled the company to substantially reduce handling time, and has resulted in a smoother production flow. Production increase, with the new chuck, is reported to average 50 pct over output of the same lathe with only an air-chuck or a hand-indexing chuck. Positive indexing of the chuck also improved part quality.

Lot sizes in brass castings for water meter parts range from 3000 to 8000 at Ford Meter Box Co., Wabash, Ind. Many of the water meter parts and fittings for their installation have fairly close machining tolerances. Direct labor savings of 20 pct are reported to have resulted from installation of the air-operated, air-indexing 2-jaw chucks on their Electro-Cycle lathes. Other benefits include reduced handling, less material in process, and a smoother production flow throughout the plant.



OPERATOR'S LEFT HAND is on chuck control in setup at H. A. Thrush Co. Parts do not have

to be removed from chuck for successive machining operations. Foot controls also used.



ASA Will Simplify Surface Roughness Measurements



By F. W. Witzke
Mechanical Section, Equipment Dept.
Brush Electronics Co.
Cleveland

◆ MORE ACCURATE surface roughness measurements are vitally needed by industry to aid in making products that last longer, carry heavier loads, and give better performance. In an effort to obtain more accurate and more consistently reliable surface roughness measurements, much of industry and the military will soon start to change from root-mean-square (rms) to arithmetic average microinch readings. Such a change would conform with the proposed revision of American Standard ASA B.46 1953 "Surface Roughness, Waviness, and Lay."

For most purposes a broad range of surface roughness may be satisfactory. Ideal finish is

- ◆ Use of arithmetic average microinch readings for surface roughness measurements are recommended in a proposed revision of American Standard ASA B.46 1953 . . . The revision, representing a step toward greater accuracy in surface roughness measurements, would replace root-mean-square microinch values.
- ♦ Much of industry and the military are planning to make the switch in accordance with the proposed revision . . . Standardization of several fundamental characteristics of stylus type instruments will be proposed . . . Arithmetic average values, already used in many American Standards and in Great Britain, would represent another step toward a workable international standard.

usually the roughest surface which will do the job since this is the easiest and most economical to produce. Industry, in its efforts to meet finish specifications, often over-finishes "just to be sure." Beyond the obvious waste of productive capacity, the over-finished surface may not function as intended.

Of the many methods used to measure surface roughness, stylus type instruments which electrically amplify vertical displacement of a pointed diamond stylus, are most common. Several factors, however, have limited their accuracy and use.

Lacking a suitable calibration standard, overall accuracy of an instrument in good condition has been at best ±15 pct. In some instances two different makes of instrument may produce different readings for the same surface. This does not mean that one instrument is necessarily wrong. Because instrument characteristics were not standardized each manufacturer developed an instrument with the roughness width cutoff and other fundamental characteristics which he considered best. Conversion of surface roughness into a descriptive mathematical figure which will be the same for any instrument requires standardization of fundamental instrument characteristics.

The proposed revision of ASA B.46 1953 "Surface Roughness, Waviness and Lay" recognizes this need. It standardizes important characteristics of stylus type instrument which influence numerical evaluation of a surface.

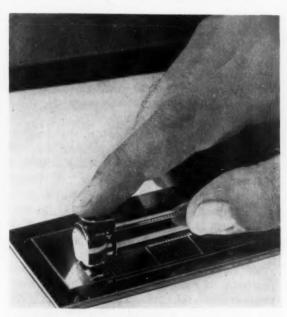
Dimensions of the stylus limit the size of surface irregularities which may be entered. The smaller the stylus tip, the better the penetration into surface irregularities. But as the tip becomes smaller it is increasingly subject to physical damage. Stylus tip radii below 500 microinches have little effect on measured roughness values. Above this value the error in measurement increases at a rapid rate. To satisfy requirements of strength and accuracy a standard tip radius of 500 microinches ± 30 pct is specified.

To follow the exact surface contours, a small force must be applied to keep the stylus in contact. Too great a force will cause the stylus to cut through surface irregularities rather than travel over them. A force not greater than $2\frac{1}{2}$ grams is specified.

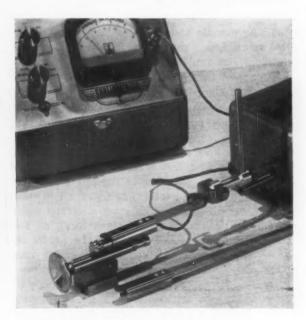
Reference surface needed

Also needed is a reference surface against which stylus displacement is measured. This is most conveniently done by supporting the pickup containing the stylus on skids with a large radius compared to height and spacing of the surface irregularities. If the radius is too small, the skid will act as a secondary stylus and this displacement will be added to or subtracted from the stylus movement resulting in erroneous readings. Space limitation sometimes make it necessary to use skids of small radii. The error on smooth surfaces will be small and become larger as surface roughness increases.

Roughness of most surfaces varies considerably. Consequently, meter indications of instantaneous average roughness will also fluctuate considerably. To reduce these fluctuations and give a more easily interpreted meter indication, response time and meter characteristics are controlled. To allow the meter to reach maximum



PRECISION REFERENCE specimens used to calibrate surface roughness instrument were jointly developed by General Motors and Chrysler.



BASED ON RESEARCH by General Motors Research Laboratories, new equipment has been developed to meet proposed standard.

indication, a sufficient length of surface must be traced. On very small surfaces this is accomplished by repeated traces of the same area.

All instruments are designed to include only irregularities spaced less than a given value, usually referred to as the roughness width cutoff. This determines the distance over which surface irregularities are averaged to obtain average roughness height. Each cutoff value may result in a different instrument reading.

Overall electromechanical response is defined and instrument accuracy is specified as not more than ±10 pct of true average value of mechanical input. Only the characteristics, not the principle, of the instrument are defined.

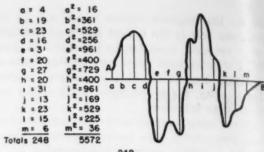
Standards for calibration are a necessity in any field of measurement. Until recently surface finish instruments had no adequate precision calibration standard. The machines, etched, sand blasted, and scratch specimens used all have limitations. Specimens varied considerably over their areas and were not readily reproducible. The Geometric Precision Roughness Specimens developed by General Motors and Chrysler Corp. have a high degree of accuracy, are uniform throughout their areas, and may be reproduced in large numbers.

The proposed revision of the ASA Standard B.46 defines the construction and acucracy, ± 3 pct, of these specimens and their use with stylus type instruments. Proper use of these specimens permits each operator to calibrate his instrument and to determine the condition of the instrument and stylus thereby assuring maximum accuracy at all times.

Arithmetic averages vs. RMS

The suggested change from rms to arithmetic average microinches is based on several considerations.

- 1. Arithmetic average, also known as centerline average, is a step closer to a workable international standard. It is already used in Great Britain and in many American standards such as those of the SAE.
- 2. No instruments in common use actually measure true rms value of a surface. Such instruments actually read arithmetic average value plus some conversion factor. This will provide actual rms value for a sine wave form only. Most electrical instruments use an averaging type meter plus a conversion factor of 1.1 to read rms values directly. Since most electrical measurements deal with a sine wave form, no inaccuracies exist. However, since the profile of a surface is generally complex, so-called rms microinch readings are not arithmetic average or rms values for the surface, but somewhere in between. Since arithmetic average is actually what the meter reads, it seems logical to use that as the instrument unit.
- 3. An arithmetic average value is more readily understood than rms average values.



Arithmetical average = $\frac{248}{13}$ = 19.1 microinches

Root mean square average = $\sqrt{\frac{5572}{13}}$ = 20.7 microinches rms

HERE'S HOW arithmetic average and rms microinch values of a surface differ theoretically. In measuring instruments, the rms reading is actually the arithmetic average plus 11 pct.

- 4. It is also simple to use a planimeter or to compute the arithmetic average value from the chart of the surface profile. Determination of a true rms value from a chart is much more complex.
- 5. Most existing instrumentation such as the Brush Surface Analyzer and Surfindicator require only the adjustment of the calibration or gain control to convert from measurement of rms to arithmetic average value.

Effects of changeover

Conversion from rms to arithmetic average microinch readings should create no great confusion. Several large automotive companies are using the following approach:

- 1. All surface finishes will be read in arithmetic average microinches regardless of whether rms or arithmetic average is specified on the blueprint.
- 2. It is possible to do this without difficulty. The difference between the arithmetic average and rms is only 11 pct. Normal point to point variation in surface roughness is usually considerably greater than 10 pct. The 11 pct difference is within present tolerances of surface roughness measurements.
- 3. This change-over procedure requires no changes in old blueprints or specifications. Instruments need be calibrated to read arithmetic average only.

First instrument manufactured which meets all requirements of the proposed ASA Standard is the Brush Surfindicator, Model BL-110. This instrument also complies with all present industrial and military specifications. It may be calibrated using the Caliblock Precision Reference Specimens to read directly in arithmetic average or rms microinches. The instrument, portable and simple to operate, was developed by General Motors Research Laboratories and is manufactured under license by Brush Electronics Co., Cleveland.

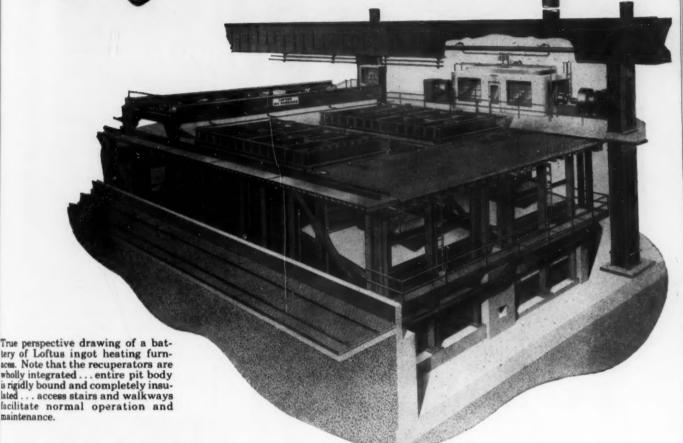
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PERFORMANCE

with States PIT FURNACES



The Loftus top-fired recuperative pit furnace combines all the accepted improvements in the modern ingot heating furnace PLUS new features designed to accelerate production . . . improve temperature uniformity . . . increase fuel economy . . . and reduce pit maintenance and steel conditioning costs. The improved Loftus tile recuperator reduces leakage and

provides a "Thermal Flywheel" which helps return the pit to normal operating temperature in the shortest possible time after charging.

Each Loftus Pit Furnace features "Heat Acceleration"... synchronized to ingot charging temperature... to increase production; and "Flame Tempering," to prevent overheating, and to insure uniformity. Write today.

WRITE TODAY! Actual operating data on Loftus Pit Furnaces will be made available upon request. Ask for latest literature describing in detail Loftus 2-way top-fired recuperative soaking pits.



ENGINEERING CORPORATION

Designers and Builders of Industrial Furnaces

610 Smithfield Street, Pittsburgh 22, Pennsylvania





-Technical Briefs

Now, with the quick pack, only three elements are needed: the reinforced corrugated container; the two-piece fiber pack; and steel strapping.

A product of the Speed Pack Div. of the McDonough-Lydon Co., Hoboken, N. J., the new pack won Air Force certification two years ago. Since its adoption by Wright it has been used to ship the largest number of parts leaving the engine division's plant.

Two Different Sides

The packing material itself consists of laminated layers of industrial fiberboard chemically treated to cushion the inside of a shipping container while keeping the outside hard and achieving a negative Ph factor. This is a measure of acidity and is necessary to protect the part from corrosion.

Die-cut to the particular engine part, the pack is then turned out on forms on a production-line basis. It is capable of maintaining dimensional stability during repeated shocks.

How They Fit Together

What had been a complicated system requiring many inserts in the packing box for shipping Wright cylinders is now reduced to a system employing two pieces.

A square bottom piece is die-cut with a circular cut-out in the center. This is placed in the bot-



Die cutouts help . . .

Turn Page

This joint must carry water at 500°F and 1600 p.s.i.

RADIOGRAPHY says the weld's sound

To gain top efficiency, modern power plants are operating at higher pressures and higher temperatures—conditions which call for utmost dependability in the welded joints of the piping.

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el

Here radiography is invaluable; it alone can prove the soundness of the welds.

In this way radiography has opened new fields to welders. In high pressure piping, in the manufacture of pressure vessels, and in other applications where welding was once banned, it is now an accepted procedure.

Radiography can help you build business as well as earn a reputation for highly satisfactory work.

If you would like to know more about what it can do for you, talk it over with your x-ray dealer.

EASTMAN KODAK COMPANY X-ray Division, Rochester 4, N. Y.

Radiography . . .

another important function of photography



coil-itis increasing your temperature problem?



Here is a new treatment for solving your heat transfer problems that is as revolutionary as a new wonder drug. It stops coil-itis* cold . . . It eliminates the many troubles that have plagued industrial heating and cooling practices due to the use of old-fashioned, outmoded pipe coils. This revolutionary new unit, called a Platecoil, heats or cools 50% faster and takes 50% less space in the tank. It simplifies maintenance and saves hours of downtime.

Write for bulletin P73 today!



PLATECOIL DIVISION, TRANTER MANUFACTURING, inc., LANSING 4, MICHIGAN

tom of the reinforced corrugated container. Next, the cylinder is placed in the box, the bottom of the barrel fitting into the round opening of the pack. Finally, the top piece, with its moulded cutouts fitting the cylinder top snugly, is placed above it.

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Some of the larger items for Wright piston engines crated with the new pack are the power recovery turbines for Wright Turbo Compounds, nose sections, crankcase sections, supercharger housings for Turbo Compounds and other Wright aircraft engines.

Wright J65 turbojet engine parts shipped with it include starter generators, combustion chambers, compressor rotors, and tail cone sections.



Band before boxing . . .

Flight:

Claims British lead in speed for jet craft.

Great Britain is 5 years ahead of the U. S. in jet engine development, according to Dr. Owen A. Saunders, visiting British jet scientist.

In a talk at Illinois Institute of Technology recently, he said the reason for Great Britain's jet superiority is the fact that it was the first of Allied countries to develop a jet engine during World War II. Although Germany had jets before Great Britain, it was in no position to follow up this lead, Dr. Saunders explained. He predicted that in 10 years jets will be flying at speeds twice as fast as sound.

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Translations pool for technical material established.

Increasing demand for translations of technical material appearing in other countries will be met in part with a new Translations Pool set up by the Special Libraries Assn. in cooperation with the John Crerar Library, Chicago.

The Association has deposited in the Crerar Library 1300 translations which form the nucleus of the Pool. In the near future a list of these translations will be available for distribution. Arrangements are under way for the listing of future contributions in technological journals in the fields covered by the translations.

Other Material Wanted

Because the usefulness of the Pool will be in direct proportion to the number of translations available, contributions are solicited from government agencies, technical societies, universities, industries and individuals. Contributions may be made by the deposit of copies of translations.

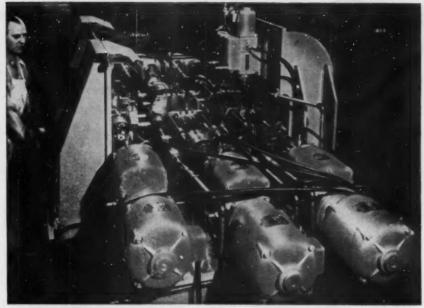
If copies are not available for deposit, they may be loaned to the Crerar Library for a short time, with permission to microfilm, or alternatively, a 35 mm microfilm may be deposited. Permission to lend or to reproduce in photocopy is a condition of deposit.

But Not From Russian

Translations and requests for information regarding availability of translations should be addressed as follows: S.L.A. Translations Pool, John Crerar Library, 86 East Randolph Street, Chicago 1.

In view of the recent announcement by the National Science Foundation of the establishment of a center for holding and photoduplicating scientific translations with particular emphasis on those in Russian, the S.L.A. Translations Pool will be devoted to translations from languages other than Russian.

Turn Page



Machine Datails
Dimensions: 10¾' long, 6½' wide, 7' high; weight about 16,000 lbs. 8 Delta drill units: 6 Model 19-400; 2 Model 19-150. 5 drill units equipped with multiple-spindle drill heads. Total HP—13.



Cantrol Panel
Selector switches make possible any combination of 3
positions, 8 stations—a universal machine. Operator
presses a starting button; sequence of operations is automatic; machine stops automatically when work is finished.
3000 feet of wiring between panel and machine.

When conventional tools required 25 minutes to complete 9 holes in a spirit-duplicator cylinder, A. B. Dick engineers built their own special horizontal drilling machine, using 8 Delta air powered hydraulic drill units, and now do the job in less than two minutes. Their new machine drills, spot faces

Their new machine drills, spot faces and reams 9 holes in aluminum cylinders—needs but a single operator, has automatic remote control.

Operation of this 3-position, 8-station machine consists of loading and pressing the starting button. The Delta drill units operate in four banks, in automatically controlled sequence of drilling, spot facing, milling and reaming. When the cycle is completed, the finished piece returns to original position and the machine stops. It is uni-



DELTA QUALITY
MAKES THE DIFFERENCE

From 25 minutes to 2 minutes -that's the time saved by A.B.DICK CO.

WITH 8 DELTA AIR-POWERED HYDRAULIC DRILL UNITS

versal—handles any piece up to 12" diameter and 24" length.
"This machine is so fast and so accu-

"This machine is so fast and so accurate," says Edward Brenn, design engineer, "that 3 or 4 days use per month is ample to keep up with production demand. The operator is free for other duties. We just didn't have the equipment to do this job economically—so we built the machine ourselves."

Three Delta air powered hydraulic drill unit models are now available to meet your specific requirements—1½°, 4° or 6° stroke; No. 80 to 1° diameter drill. See your authorized Delta drill unit dealer—write for new catalog.

DELTA QUALITY MACHINE TOOLS

Another Product of Rockwell

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		723. horized Delta drill
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Flared bronze bushings, centrifugally cast and finish-machined by Shenango.

SHENANGO Centrifugally Cast Parts "Tailot-Made" to your specifications

A big advantage you buy with every Shenango part is the assurance the part will give the longest possible wear . . . and if precision-machined by Shenango . . . you know it will fit perfectly on delivery.

HERE'S WHY ...

(1) Shenango centrifugally cast parts are more uniformand pressure-dense. They are free from sand inclusions, blowholes and other often hidden defects. (2) You specify the type metal so the completed Shenango part is actually "tailored" to last longer on

your specific job. (3) Modern machining facilities and skilled workmanship give you semi- or precision-finished parts... precisely as specified, at minimum cost.

FREE BULLETIN No. 150 covers nonferrous metals; Bulletin No. 151 covvers Meehanite Metal, Ni-Resist and special iron alloys. Address...

SHENANGO-PENN MOLD COMPANY

Centrifugal Castings Division
Dover, Ohio

Executive Offices: Pittsburgh, Pa.

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ALL RED BRONZES . MANGANESE BRONZES . ALUMINUM BRONZES

MONEL METAL . NI-RESIST . MEEHANITE® METAL

Tube Sizing:

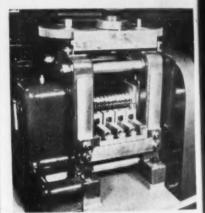
Greater accuracy attained with new small mill.

Accurate and rapid tube reducing and tube sizing on a low cost basis is now possible through a special modification of the recently developed small wire rolling mills by engineers of Stanat Mfg. Co., Long Island City, N. Y.

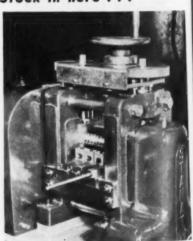
One of the many applications for which the new tube reducing rolling mill can be used is the processing of tubular heating units. With the machine the smaller electrical manufacturer can process his own tubing and size it with predetermined, precise results.

Powder Compacted

In tubular heating units, a refractory powder must be compacted around a resistance element to create rigidity of positioning and to exclude air. In older methods, tubes

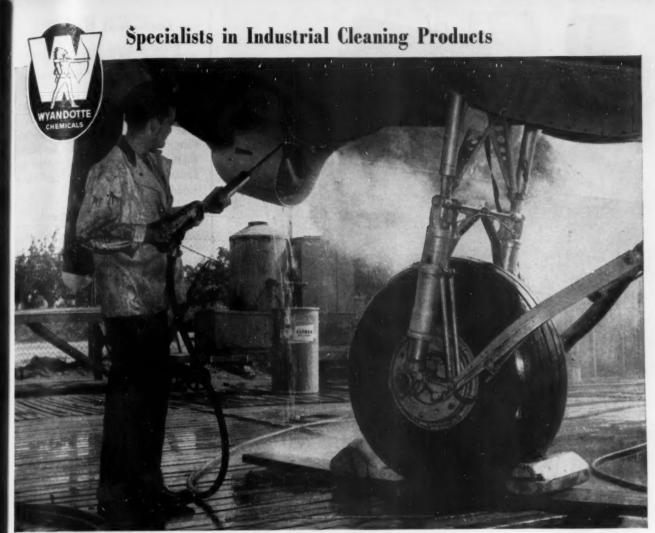


Stock in here . . .



Tubing out here . . .

Turn Page



Wyandotte Altrex* at work: steam cleaning oil coolers and wheel wells on a C-47.

"ALTREX cuts scale formation, eliminates frequent descaling on steam units."

Southern California Aircraft Corporation.

Southern California Aircraft Corporation had a problem on steam cleaning: How to keep scale formation down and, at the same time, get potent detergency on greasy surfaces to eliminate hand cleaning.

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They tried Altrex, Wyandotte's nonetching aluminum cleaner. It reduced the scale formation, stretched the time interval for descaling heater coils from two weeks to two months, and reduced descaling downtime on steam machines!

An impressive performance? Certainly But, in addition, Southern Cali-

fornia Aircraft Corporation found ALTREX fast-acting and free-rinsing with exceptionally low "use-cost"!

Wyandotte ALTREX also has additional industrial uses—soak cleaning of aluminum prior to anodizing, alodizing and spot welding. In such applications, its long-lived solutions, exceptional detergency, noncorrosive and free-rinsing properties make it especially effective.

Investigate ALTREX for its outstanding performance and amazing economy!

Wyandotte has kept pace with the growing demands of industry by furnishing tested products to meet many specialized needs. Some of these products are Pre-Fos*, for high detergency in phosphating; EMLON*, a versatile emulsion cleaner; Mersostrip, a fast-

acting akaline paint stripper; ZORBALL, all-purpose floor absorbent. If you have any industrial or aircraft cleaning problems, your Wyandotte representative is the man to call. Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Angeles 12, California.



Helpful service representatives in 138 cities in the United States and Canada.

Largest manufacturers of specialized cleaning products for business and industry

GE

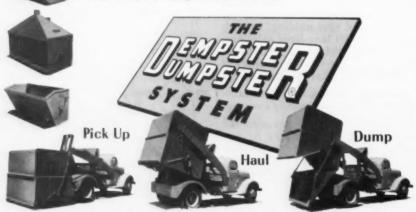


You will Dump High Costs, too...

when you install the Dempster-Dumpster System of bulk materials handling.

Manufacturers over the nation have learned to eliminate the costly and inefficient method of handling bulk materials with conventional dump trucks, drivers and loading crews. You can equip one truck with a hydraulically operated Dempster-Dumpster. Then, inside or outside buildings at convenient accumulation points, you simply place detachable Dempster-Dumpster Containers, in capacities up to 4 times that of conventional dump truck bodies, with each designed to suit the materials to be handled—be they solids, liquids or dust . . . hot or cold . . . bulky, light or heavy. Containers shown at left, all handled by one Dempster-Dumpster, are only a few of the many available or that can be built to meet your needs. The Dempster-Dumpster, operated by only one man, the driver, serves scores of containers—one after another, as shown below.

You eliminate trucks standing idle. You eliminate re-handling of materials. You eliminate loading crews. You increase efficiency, sanitation and good plantkeeping with this Dempster-Dumpster System—the lowest cost method of bulk materials handling ever devised! Write to us for complete information. Manufactured exclusively by Dempster Brothers, Inc.



DEMPSTER BROTHERS, 4123 N. Knox, Knoxville 17, Tenn.

-Technical Briefs.

were sized, or hammered, by hand. This was extremely costly and results were spotty.

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Now, with the rolling mill, tubular heating units for stoves, broilers, immersion heaters, and other electrical equipment can be manufactured more efficiently with reduced labor costs and far fewer rejects.

Greater Density Attained

Laboratory tests made by manufacturers of tubular heating units have shown the density of the filler to be greater than that produced by other methods.

For the first time, mills of such dimensions now incorporate many features formerly associated only with the heaviest type of equipment. These features include housings cast of Meehanite type GM alloy to withstand extreme stresses and shockloads.

Can Use Water Cooling

Heavy bronze bearings are completely enclosed within a heavyduty welded steel cabinet-type base. In addition, 4 in, units are available with roller bearings and can be arranged for water cooling.

The possibility of marring fine finishes is minimized with these mills, since the upper rolls are driven from the lower rolls through hardened helical gears; thus, gear marks on finished pieces are eliminated. All of these features are incorporated in the complete lines of both the three- and four-inch rolling mills.

Federal Specs:

Navy bureau report describes and tells how to get them.

People who do business with the Government will be happy to know that an effort is being made to reduce the number of specifications necessary for government procurement. While this operation moves on at its usual glacial celerity a little order begins to appear in the maze of specifications of federal agencies and the military. Some clues are given on where specifications may be

Technical Briefs-

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Specifications are being limited to two series . . .

obtainable, their purpose, etc., in a recent Navy publication.

This is in the form of a report by Margaret P. Haskin, of the purchase specifications and standards branch, Navy Dept., Bureau of Ships. Miss Haskin, who has spent 11 years in this branch, has produced a clear, but detailed report in 13 pages, "Federal and Military Specifications Information for Commercial Concerns."

Specifications used by the military departments are being limited where possible to two main series, Miss Haskin says, the Federal and the Military. Individual specifications-like the old Navy specifications - are being incorporated into the Federal and Military series as rapidly as possible.

Federal Specifications

Federal specifications (originally known as U.S. Government Master Specifications) cover supplies and materials of interest to and in common use by two or more Government Departments, at least one of which is civilian. These specifications are administered by the Director of Federal Supply, General Services Administration.

A revision of a Federal specification supersedes entirely the previous issue including any amendment thereto. Revisions are indicated as follows:

(a) Regular-Revisions to regular Federal specifications are indicated by the addition of a small letter-a, b, c, etc.-to the symbol in the upper right hand corner of the first page.

(b) Interim - Several different methods have been used to indicate revisions of interim Federal specifications. Among these methods are superseding by date only, and the use of revision letters as described for the regular Federal specifications.

Minor changes in a Federal specification are made by amendment. Amendments bear the specification symbol, the amendment

Turn Page



SQUARE-RECTANGULAR

1/2" to 2" 20 gauge, 1" to 23/4", 14, 16, 18 gauge Carbon 1010 to 1025

Michigan Tubing

has uniform strength, weight, ductility, I. D. and O. D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

cost by Michigan for its customers.

The overflow pipe is brazed to the filler tube at two points and the fastener clamps projection welded to the tube. The cam is spot welded to the tube mouth.

If you have not yet examined the possible adaptability of welded steel tubing to your product, Michigan engineers will be glad to discuss with you the many advantages of design simplification, production savings and product improvement made possible by the use of Michigan tubing.



Consult us for engineering and technical help in the selection of tubing best suited to your needs.

Plus Fabricating of our own tubing Michigan is interested ONLY IN THE FABRICATION OF Stainless steel, copper, brass and aluminum tubing.



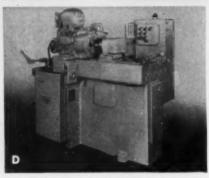
DISTRIBUTORS: Steel Sales Corp., Chicago, St. Louis, Milwaukse, Indianapolis and Minneapolis—1 Steel Co., Inc., Hillside, N. J.—C. L. Hyland Co., Dayton, Ohio—James J. Shannon, Milton, Me Service Steel Co., Los Angeles, Calif.—Strong, Carlisle and Hammond Co., Cleveland, Ohio—G Supply Co., Denver, Colorado—W. A. McMichaels Co., Upper Darby, Pa.—A. J. Fitzgibbons Buffelo, N. Y.—Harry E. Clark & Co., Houston, Texas—J. B. Beaird Co., Inc., Shreveport, I. C. I. Crais Co., Birminghum, Alabame.

METALS









Berylco beryllium copper plays a vital role in many production tools. As, for instance, in the: (a) Blanchard Surface Grinder; (b) New Britain Gridley 6-Spindle Automatic Screw Machine; (c) Pratt & Whitney Pneumatic High-Speed Grinding Head; (d) Chucking Grinder. For parts used, see below.

BERYLLIUM COPPER...a miracle metal with down-to-earth capacities

The miraculous quality of Beryllium copper is its versatility. Here, in one alloy, are combined such properties as strength, conductivity, elasticity and fatigue resistance. Ask makers of production tools why they choose Berylco. You'll get dozens of reasons. Economy. Ease of production. Hardenability, etc., etc. But it is the capacity of Berylco to make a better product—one that delivers long life with minimum maintenance—that is its outstanding appeal.

In the automatic screw machine shown above, wear—and expensive maintenance—in the stock feeding mechanism was eliminated by replacing the offending parts with smaller, more efficient ones made of Berylco. In the chucking grinder, where this alloy is used for "plain" bearings in the cam follower rolls, the dense surface structure of Berylco makes possible an extremely accurate, frictionless bearing. The spring properties of Berylco are all important in the Pratt & Whitney grinding head, where it is used for a spring governor; and in the Blanchard, where it is used for wheel clamps. Because Berylco is corrosion resistant, these clamps do not have to be plated. The nonmagnetic properties of Berylco also eliminate sticking.

One of the best things about Berylco beryllium copper is its availability in any quantity or form you need. If you would like to find out what this unique alloy can do for you, write the world's largest producer of beryllium copper, THE BERYLLIUM CORPORATION, Dept. 3L, Reading 6, Pennsylvania.

Tomorrow's products are planned today—with Berylco beryllium copper









(a) Berylco spring clamps used in the solid wheel holder of a Blanchard Surface Grinder; (b) A few of the Berylco castings in the stock-feeding mechanism of the New Britain Automatic; (c) Berylco spring governor used in the Pratt & Whitney Pneumatic High-Speed Grinding Head; (d) Berylco bearings found in the cam follower rolls of the Chucking Grinder.

-Technical Briefs-

Here's what the various letters stand for . . .

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number, and the date of the amendment in the upper right-hand corner. Only one amendment is in effect at any one time; subsequent changes in the specification are made in a superseding amendment that includes all changes to the date of its issue. Superseding amendments are indicated by the figure "2," "3," etc.

Military Specifications

Military specifications, formerly known as Joint Army-Navy (JAN) Specifications, cover those materials, products or services used solely or predominantly by Military activities. While the use of these specifications is required only for Military activities, they may be used by other Federal agencies if desired.

Issued As JAN Specs

These specifications were issued first under the auspices of the Joint Army-Navy Specifications Board as "JAN" specifications. The series was continued by the Munitions Board Standards Agency (MBSA) and later by the Defense Supply Management Agency (DSMA) in the same nonsignificant numerical sequence, with the only change being the adoption of the prefix "MIL," although the number remains the same. This numbering system has also been retained by the Office of Standardization (which succeeded the Defense Supply Management Agency) and which now has the responsibility of administering Military specifications and standards.

Coordinated and Limited Military Specifications

In addition, specifications cannot go beyond current industrial techniques or the potential capacity for production necessary to meet quantity requirements.

Military specifications are of two types, "coordinated" and "lim-

Technical Briefs

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How coordinated specifications are identified.

ited coordination." "Coordinated specifications are concurred in by all interested activities of the three military departments and cover items of common use. "Limited coordination" specifications are those of single departmental interest or those prepared by a department or activity to satisfy an immediate procurement need.

Coordinated specifications are identified by a symbol composed of three parts; the letters "MIL" (abbreviation for Military) followed by a single letter, which is the first letter of the first word in the title, and a serial number. For example, the symbol for the specification covering chair, wood, steamer type, is MIL-C- (for the word "chair") 852 (serial number). As existing specifications carrying the prefix "JAN" are revised, the prefix is changed to "MIL" although the number remains the same.

Limited coordination specifications are identified by a suffix to the basic symbol. This suffix identifies the activity issuing the specification, i. e., MIL-C-852 (SHIPS).

Revisions of Military specifications are indicated by a capital etter following the Symbol and preceding any suffix. The first revision will be marked with the letter A and succeeding revisions will be marked by the other letters in alphabetical sequence except that the letters I, O, Q and S will not be used.

Federal Index

The index issued by General Services Administration as "Index of Federal Specifications and Standards" is a complete listing of all Federal specifications and standards issued under the auspices of GSA.

Copies of the monthly supplements may be purchased from he Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price \$1.75.

Turn Page



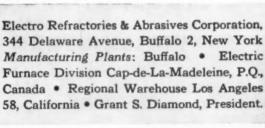
SPECIFIC PURPOSE

Resin . Vitrified GRINDING WHEELS

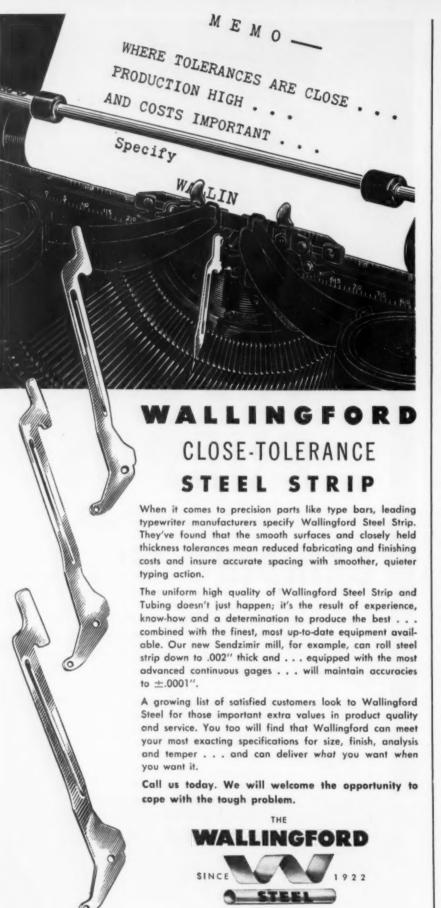
Competently specified for your job by our technical experts, Electro Specific-Purpose Grinding Wheels pre-prove their superior worth at your job-side in test runs.

May we send a representative to your job-side to see if we can help better your grinding operation? No obligation.

ELECTRO'



December 3, 1953



LOW CARBON . HIGH CARBON . ALLOY . STAINLESS . STRIP and TUBING

WALLINGFORD, CONN., U.S.A.

-Technical Briefs.

Where to obtain copies of the specifications . . .

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The Military index of specifications is divided into four volumes, Vol. I has been temporarily discontinued. The other volumes are as follows: (a) Index of Specifications and Standards, Used by Dept. of the Army, Military Index, Volume II. (\$2.75); (b) Index of Specifications and Standards, Used by Dept. of the Navy, Military Index, Volume III. (\$2.50); (c) Index of Specifications and Related Publications, Used by Dept. of the Air Force, Military Index, Volume IV. (\$2.75).

Copies may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at the prices in parentheses.

Copies For Bidding

Copies of Federal Specifications may be obtained upon application. accompanied by check, money order, cash, or Government Printing Office coupons, to the General Services Administration, Business Service Center, Region 3, Seventh and D Streets, S. W., Washington 25, D. C. This office will also honor deposit account numbers issued by the Government Printing Office. Single copies of Federal product specifications required for bidding purposes are available without charge at the GSA Regional Offices in Boston, New York, Atlanta, Chicago, Kansas City, Mo., Dallas, Denver, San Francisco, Los Angeles, Seattle, and Washington, D. C. Prices of additional copies may be obtained from the GSA Regional Offices.

Information regarding copies of specifications for use in connection with Military procurements may be obtained from purchasing offices or inspector's offices, Miss Haskin says.

Copies of individual specifications used by the Army and the Air Force may be obtained as indicated in the foreword in the applicable volume of the Index.

Technical Briefs

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Copies of specifications used by the Navy, and listed in Volume III of the Index may be obtained upon application to the Commanding Officer, Naval Supply Depot, Scotia 3, N. Y., except for specifications in the Military series bearing numbers 5000 to 9999 and designated by the letter "A" only in the "Activities concerned" column of Volume III which are referred to as aeronautical items. These latter specifications are stocked and issued by the Technical Records Division, United States Naval Air Station, Johnsville, Pa.

Mobility:

Improved mounts simplify movement of machines.

A new concept in industrial machine mounting may hold the answer to greater mobility in the handling of plant equipment. Light leveling mounts, developed by the Barry Corp., Waterton, Mass., permit machines to be quickly moved without much of the usual slow work involved in tieing a machine to the floor, it is claimed.

Aid to Planning

The mounts, costing about \$50 per set and capable of supporting six tons each, have proved helpful to engineers planning a new production line. Conventional machine mountings, which often require heavy concrete beds to support thick floor bolts, give management



Starting position . . .

Turn Page

December 3, 1953

WILLSON SAFETY SPECTACLES

... Everything you want in

- . PROTECTION
- · COMFORT
- . STYLE

STYLE WB—Distinctive bronze-color butyrate frame. Non-flammable. Toughest plastic made for spectacles. Standard cable or spatula type Hi-Line®temples. Light, sturdy, handsome. (With matching sideshields, Style WBS.)



STYLE A—Strong metal frame, on-line temples, with metal reinforcing bar or pearloid brow rest. Rocker nose pads. Exceptionally comfortable. (With sideshields, Style AS.)



STYLE AH—Single-bridge metal frame with Hi-Line® temples. Rocker nose pads. Light yets asfely sturdy. (With sideshields, Style AHS.)

STYLE AV—Modern metal frame with Hi-Line® temples, metal reinforcing bar. Rocker nose pads add extra comfort. A popular style of outstanding value. (With sideshields, Style AVS.)



STYLE WK—Sturdy fleshcolor butyrate frame—"keyhole" bridge. Choice of spatula or half-plastic, halfcable temples. Adjustable for perfect fit. (With sideshields, Style WKS.)

Write for Willson Spectacle Data Chart and outline of our complete program on corrective-protective eyewear.



ASK YOUR WILLSON DISTRIB-UTOR to show you the Willson Sample Kit of Safety Spectacles which includes lenses, frames and sideshields available.



WILLSON PRODUCTS, INC., 231 Washington St., Reading, Pa.



of the "HIGHLINE" ATLAS ore transfers

We've been building transfers longer than we care to remember . . . most of them are still running. They are the "Star" performers on the highline. We're proud of their ability to meet specific performance requirements of our customers.

50-Ton Ore Transfer



This Atlas Ore Transfer is equipped with modern hydraulically operated discharge gates and brakes. Steel plate trucks are provided. The cab is overhung at one side to give the operator a line of vision alongside the car. The car is equipped with electric space heaters.



Scale Cars



Coke Quenchers



THE ATLAS CAR & MFG. CO.

ENGINEER

MANUFACTURERS

1140 IVANHOE RD.

CLEVELAND 10, OHIO, U. S. A.

- Technical Briefs.

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Machines Easily Changed

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Now

Waste motion and duplication of effort can be eliminated quickly if a machine can be picked up without taking half of the floor with it. Time study men and efficiency experts can afford to experiment boldly and discover and remedy unsuspected operating losses.

Speed in converting plant output is essential in responding to elastic markets. The mobility offered



Assembly line moves . .



Machines start again ...



All working now . . .

Technical Briefs

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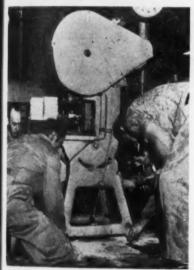
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by these mounts can also mean a bigger return on existing machinery, and less outlay for new equipment. They cannot only free machies for more work, but can free space that would otherwise be unusable. By eliminating the need



Now in production . . .



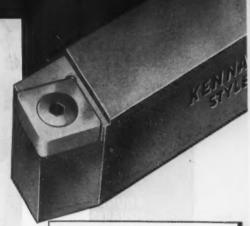
Still drilling holes . . .



Simplifies leveling . . . Turn Page

It isn't KENDEX* unless it's KENNAMETAL*

KENDEX* is the
Registered Trade-Mark
of Kendex Tools
which are made
exclusively by
Kennametal Inc.



Kendex tools feature a precisionground, multiple-edge, screw-mounted, indexable Kennametal insert that needs no regrinding. When the insert's multiple cutting edges become dull, to throw it away is economical practice. Replacement cost is slight compared to that of regrinds.

Kendex tooling minimizes downtime for tool changing, eliminates tool grinding expense, and ends the false economy of reconditioning tools that have outlived their usefulness. Ask your nearest Kennametal representative for details. Kennametal Inc., Latrobe, Pa.

*Registered Trade-Marks

How KENDEX* Works







Hard, strong, wear-resistant Kennametal is molded into square, round, or triangular Kendex inserts, which are precision ground.

2

Kendex inserts are mounted to suitable tool holders with socket head screws.

3

When edge becomes dull, insert is turned to new cutting position. When all cutting edges have been used, insert is thrown away; no regrinding.





for reenforced concrete floors to carry lag bolts, and by reducing rotary vibrations a heavy machine can be located in places that were formerly unsuitable. Because of reduced vibrations, delicate gaging can be done nearby.

Another big premium from plant mobility is reducing lost manhours from production line breakdowns. A disabled unit can be quickly replaced without a long halt in op-

erations. Maintenance in general becomes a highly simplified operation. Many industrial setups today require heavy servicing to keep them in top working condition. Increased mobility of Leveling Barrymounts has permitted some firms to set up central maintenance departments, and instead of trundling the maintenance to the production line, the machine can be replaced and overhauled at leisure.

Mine Gear:

Hoists for new copper mine among largest in U.S.

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More than a million dollars worth of electrical equipment will power and control the two largest metalmine hoists in the United States when they begin operation in 1955 at an Arizona copper mine.

Plenty of Power

The giant hoists will operate at a rope speed of more than half a mile a minute, and be capable of delivering 18 tons of copper ore to the surface every 72 seconds. The daily output of both hoists would fill a freight train 51/4 miles long, made up of 700 gondolas carrying 50 tons apiece.

Each of the two 6000-hp, doublecylindrical drum hoists, being built by the Nordberg Mfg. Co. will be powered by two GE 3000-hp, 600volt, 500-rpm, d-c mine-hoist mo-

For Two-Level Operation

A General Electric partial-equalizing flywheel MG Set-composed of two 2500 kw mine-hoist generators, a 4000-hp wound-rotor induction motor with liquid slip regulator, and a steel-plate flywheel-will furnish the 600-volt d-c power for each ore hoist.

GE also will supply complete amplistat-amplidyne control for automatic operation of the two skips in balance. The ore hoists are designed for two-level operation and will be capable of lifting the 18-ton capacity bucket up the 2425-foot shaft in 611/2 seconds.

Manual Control

A Nordberg man-and-materials hoist with a maximum rope speed of 1500 fpm also will be installed at the mine. Two GE 700-hp, 400 rpm d-c motors will drive this service hoist which will transport workers and materials to the working levels.

The combination of electrical equipment assembled at the new Arizona copper mine will permit smooth handling of large volumes of ore.

CHECK YOUR PRODUCTS

to reduce weight with HIGH STRENGTH BUFFALO STEEL

BUFFALO STEEL PRODUCTS

ROUNDS SQUARES FLATS EQUAL LEG ANGLES

> UNEQUAL LEG ANGLES

CORNER LOCK ANGLES

TEES CHANNELED FLATS U HARROW BARS DIAMOND BARS CULTIVATOR BEAMS I BARS CHANNELS FLANGED CHANNELS AND MANY SPECIAL SHAPES

> Also Producers of Hi-Bond Reinforcing Bars and "Quick-Set" Steel Fence Posts and Sign

Here is a timely suggestion. Analyse your products for all possible uses of higher strength Buffalo Rail Steel.

This higher strength steel permits standardizing on smaller angles, bars, channels, flats and special shapes, while improving product quality, and at the same time cutting weight which :-

- REDUCES RECEIVING COSTS
- **REDUCES HANDLING COSTS**
- REDUCES STOCKING COSTS
- REDUCES TRANSPORTATION COSTS OF RAW MATERIAL AND FINISHED PRODUCTS

Investigate how Buffalo Rail Steel reduces costs by writing for complete, fully illustrated catalog TODAY.

BUFFALO H. K. PORTER COMPANY, INC.

TONAWANDA, NEW YORK

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Specifications for pretreatment of steel prepared.

Specifications for the pretreatment of steel prior to painting, and specifications for the application of paint establishing a code of good industry practice have been published by the Steel Structures Painting Council, 4400 Fifth Ave., Pittsburgh.

Pretreatment Specifications cover the Wetting Oil Treatment; Cold Phosphate Surface Treatment; Basic Zinc Chromate—Vinyl Butyral Washcoat Treatment, and Hot Phosphate Surface Treatment. The set of four may be obtained for 60¢.

The detailed Paint Applications Specifications, entitled Shop, Field and Maintenance Painting, apply to the necessary painting of all interior or exterior steel surfaces of structures exposed to weather, moisture, condensation, or other corrosive conditions. They are not intended to apply to painting unexposed steel or steel which is enclosed in masonry. The price is 50¢ per copy.

Set Industry Standards

These specifications provide industry with a set of standards and when used in conjunction with the Surface Preparation Specifications and with the Painting Manual, which is to be published in December, point quickly to the best known way of doing a job; then explain how to do the job.

Over 200 specialists are working with the Council and the specifications published are the results of extensive study of case histories, surveys, field and plant paint tests and laboratory research.

Improves Paint Performance

In the wetting oil treatment the surface layer of rusty and scaled steel is saturated with a wetting oil that is compatible with the priming paint, thus improving the adhesion and performance of the paint system to be applied. This pretreatment is not intended to take the place of a coat of paint

or eliminate the necessity of surface preparation.

The cold phosphate method converts the surface of the steel to insoluble salts of phosphoric acid to inhibit corrosion and improve adhesion and performance of paints. It has proven beneficial for steel surfaces free of rust, scale, dirt or paint, and for clean galvanized surfaces. It is not intended for scaled and heavily rusted surfaces nor in touch-up maintenance

where the acid might damage existing paint areas.

Wash Primer Treatment

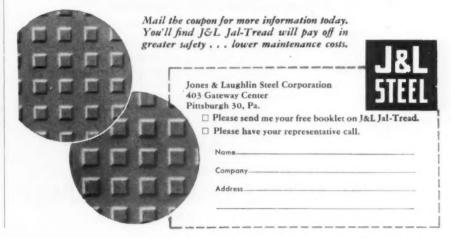
The basic zinc chromate-vinyl butyral washcoat treatment (sometimes referred to as wash primer) reacts with the steel and at the same time forms a protective vinyl film to prevent rusting. This pretreatment is to be used primarily on clean steel free of rust and scale or on galvanized metal.



The safety of your employees and the public is good enough reason to install walking surfaces of slip-resistant J&L Jal-Tread floor plate.

But here are some other important advantages you'll get when you specify Jal-Tread, the only true checker-board floor plate.

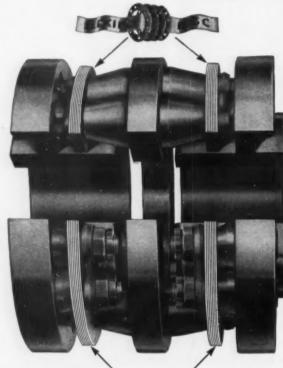
- Reduced worker fatigue from feet rocking on uneven surfaces.
- · No wheel shimmy in hand industrial trucks.
- Neat appearance . . . easy draining and sweeping in any direction.
- Easy fabrication—square design allows cutting without shearing through raised cleats . . . welding joint of uniform thickness.
- Easy cold-forming on standard equipment.



AVOID COSTLY SHUT-DOWNS!

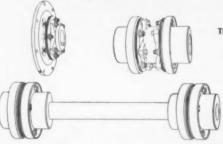
Specify THOMAS Flexible Couplings for Power Transmission

DISTINCTIVE ADVANTAGES OF THOMAS ALL-METAL COUPLINGS		
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.	
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.	
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.	
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.	
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.	



Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes.



THE THOMAS PRINCIPLE GUARANTEES

PERFECT BALANCE UNDER ALL

CONDITIONS OF MISALIGNMENT.

MANUFACTURERS OF FLEXIBLE COUPLINGS ONLY FOR OVER 35 YEARS

Write for our new Engineering Catalog No. 51

THOMAS FLEXIBLE COUPLING COMPANY

WARREN, PENNSYLVANIA, U.S.A.

Technical Briefs.

Handling:

Fork truck day embraces wide variety of tasks.

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A day in the life of a fork truck, as pictured at the East Chicago, Ind., plant of Edward Valves, Inc., embraces a wide variety of mate-



8:40 am—

Easy with that steel slab...



9:05 am—
Get some cutting oil . . .



9:12 am— We need castings . . .

Technical Briefs-

wide

ago, Inc., aterials handling problems. Photos courtesy Clark Equipment Co., Battle Creek, Mich.



10:00 am-Help us with the lights . . .



10:30 am-Let's get this die in . . .



11:20 am-Turn Page

Here's the welder . . .



Pays for itself in 3 Profitable Ways:

- TOP SCRAP VALUE. Uniform short shoveling turnings produced by an American bring up to \$4 per ton more than regular machine shop turnings.
- INCREASED CUTTING OIL RECOVERY. Up to 50 gallons per ton are released from turnings reduced in an American.
- EASIER HANDLING, STORAGE. American-reduced turnings require but a fraction of the usual storage space.. are easily briquetted.



Available in 1 to 10 tons per hour capacities to meet your needs. WRITE today for the complete American profit story.

Originators and Manufacturous of Ring Countries and Pelestyre

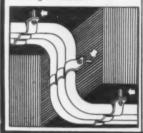
1439 MACKLIND AVE. . ST. LOUIS 10, MO.

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TO HANG....TO HANDLE....TO HOLD..

Faster installation of brackets or hangers for piping, tubing or conduit.



Fast installation of handling accessories that can be easily removed.



Split second stud welding lowers fabrication costs, improves product.



THE NELSON FASTENING ENGINEER WILL SHOW YOU



... right in your own plant how your production and your products can be improved with this modern fastening method. Your design and pro-

duction men can actually participate and test the results on your own products.

For full information on Nelweld as applied to steel fabrication, write the Main Office, Lorain, Ohio.

NELSON STUD WELDING

DIVISION OF GREGORY INDUSTRIES, INC., LORAIN, OHIO

-Technical Briefs

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1:10 pm— Reach for the high ones...



2:35 pm—

Take it to shipping . . .



3:30 pm— Ready for the road . . .

Grinding:

Titanium successfully ground with slower wheel speeds.

Titanium and stainless steels represent two of the knottiest problems in the grinding field, 500 superintendents, buyers and purchasing agents of major industrial firms in Los Angeles County were told at a recent 5-day grinding symposium sponsored by Garrett Supply Co., Los Angeles.

Problem of Heating

Susceptibility of titanium to heating is one of the problems in finishing this metal, F. A. Upper, The Carborundum Co., Niagara Falls, N. Y., told the group. Grinding wheel speeds at 40 pct of normal have been reasonably successful, but do not represent the whole solution.

Slow Down Wheels

Grinding wheel speeds employing 2000 sfpm, as opposed to a normal 6000 sfpm, result in faster stock removal on titanium, but finishes are not always satisfactory. The problems associated with grinding stainless steel are somewhat comparable.

Joining:

Transition pieces join ferritic to austenitic steel.

Unique, bi-metallic transition pieces manufactured by The M. W. Kellogg Co. for ultra high-temperature, high-pressure steam systems are used to connect ferritic throttle valves with austenitic steel main steam piping.. Reason for use of transition pieces lies in designers' reluctance to join by a butt weld two metals of widely varying thermal coefficients of expansion. The ferritic 2½ pct chrome—1 pct moly and the austenitic type 347 steels have a difference of approximately 50 pct in their thermal coefficients.

Eliminates Welding

Transition piece eliminates the need for welding these different materials together. This is accom-

Turn Page



ROSS MAKES LIGHT WORK OF JOBS LIKE THIS...

Steel plate, I-beams, pipe, lumber, or long pallet loads—this is the fast, simple way to handle it. Ross Carriers go places that other types of equipment can't go. They move your materials indoors or out, over factory floors, unimproved yards or highways. The speed and mobility of these versatile Carriers enables them to handle materials practically anywhere, under all conditions. With them, you move loads between crane-ways, eliminate unnecessary switching between plant trackage, eliminate costly rehandling. They handle the heaviest loads at the least cost.

The picture above shows a Carrier handling heavy timber arches. In steel mills and fabricating plants as well, Ross Carriers cut the cost of inter-building transfer of inprocess material, of indoor or outdoor storage of finished material. It will pay you to look into the advantages of Ross Carriers for your own operations. Write us today—discussion of your handling problems entails no obligation on your part.

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Industrial Truck Division

CLARK EQUIPMENT COMPANY

BENTON HARBOR 51, MICHIGAN

plished by Kellogg's patented Kelcaloy process in which austenitic steel is integrally bonded to a ferritic chrome-moly forging to provide a transition piece which is of the desired chrome-moly steel at one end, and austenitic stainless at the other, and having a central transition bond of controlled axial length. Following casting, the transition pieces are machined and bored to proper dimensions and heat-treated.

cient operation), the inspection department in an aircraft accessories plant, and even in such periodic operations as window washing.

Base For Plans

Incentive plans are based on three principles: (1) Plan must be simple and standards guaranteed; (2) it must be controlled—bonus paid must be for value received; and (3) it must be understood by supervisors and they must be sold on it.

Time studies supply basic data as well as data for the selling job. Where work can't be measured by a production count, the time-motion crew, tied in with pay incentives, can be a money getter for both employer and employee—from janitor to inspector.

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Time Study:

How stopwatch and incentives are put to work.

Minutes can become dollars and a man with a stopwatch can earn his firm as much as a man on the assembly line. System used by Whirlpool Corp. to combine timemotion studies and incentive pay was described by Steven Palmert at Chicago's recent Time and Motion Study and Management Clinic.

Employees Trained

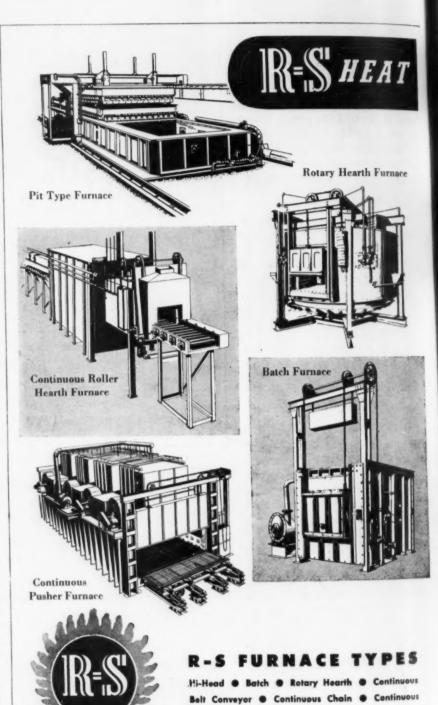
Applying such a study to its janitorial and sweeper crew, Whirlpool developed a program that paid for itself in 6 months, fattened the average cleanup man's pay envelope by 25 pct, and freed a good portion for more productive jobs.

Deciding that a time-motion group would be valuable in many ways, the firm had a crew of employees trained by an outside company. This took 3 months. Then the time-motion men made an exhaustive study, set up standards for janitorial operations throughout the 789,000-sq-ft plant.

Janitor Force Cut

A combined "assignment card" and time card allows the supervisor to enter any extra jobs he might assign. With supervisors doubling as inspectors, the 72-man janitor and sweeper force was cut to 46—leaving 26 available for directly productive work in the plant.

Whirlpool's time study crews also proved invaluable on a conveyorized finishing line (to determine the actual work force needed for effi-



Pusher • Continuous Pusher Tray • Pit •

Continuous Roller Hearth @ Car Hearth

Plastics:

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Thermosetting material has little after-shrinkage.

A new thermosetting molding material with improved arc resistance and improved dimensional stability has recently been developed by Monsanto Chemical Co.'s Plastics Div.

The new material, Resinox 3700,

combines electrical and physical characteristics most often demanded by the molders and end users of arc-resistant parts.

The material has high arc resistance, measured at 184 seconds in standard ASTM tests. It also has excellent dimensional stability, which means that the problem of after-shrinkage, a problem in many arc-resistant materials, has virtually been eliminated.

The material has good moldability, including good transfer molding properties, and a relatively good impact strength and heat resistance, it is claimed.

Mineral-filled, Resinox 3700 is recommended for use in distributor caps, motor control circuits, power transmission circuits, electrical connectors, ignition parts, switch panels and radio tube bases.

Ceramics:

New kiln design insures uniform firing.

A new high temperature (3000°F) gas fired, car-tunnel kiln has been designed by the Kiln Div., Lindberg Engineering Co., Chicago, to insure uniformity of firing, and reduce firing costs. The kiln is primarily used for firing high temperature refractory components. However, the flexibility of design makes it adaptable to the bisque or gloss firing of all whiteware as well as refractory products.

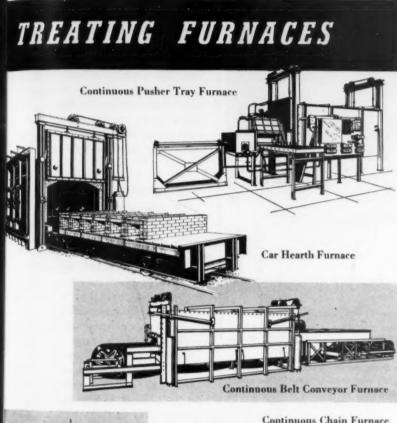
Feature Saves Floor Space

A unique hydraulic-pusher mechanism mounted under the kiln, permits savings in floor space. Another feature of the kiln is an interlocking safety control system which protects the furnace in the event of a power, blower or governor failure by means of pressure-stats and solenoid valves.

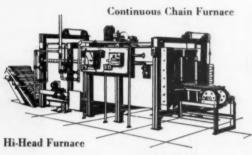
A two-zone hot section, each controlled by motor operated valves, provides completely flexible control of soaking.



Car-tunnel kiln . . .







R-S FURNACE CORP.

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A SUBSIDIARY OF HARDINGE COMPANY, INC.



Fast Jet:

"Flying Stilletto" wing span only one third length.

Described in part as a "hot" aircraft with an extremely powerful cooling system, the newly-unveiled X-3 has been studied extensively by the Air Force and will be given further tests by National Advisory Committee for Aeronautics.

A slender, twin-jet plane, the X-3 was built by Douglas Aircraft under joint sponsorship of Air Force, NACA, and the Navy. It was required for research on design features needed by planes that will make lengthy flights at very high speeds. Considerable use was made of titanium in its construction.

Its appearance has earned the X-3 the nickname "Flying Stillet-

to." Its length is more than 66 ft—nearly three times the wing span. It has a long, tapered nose, tricycle landing gear, and a weight of 27,000 lb. During air force tests in California it carried 1200 lb of research instruments.

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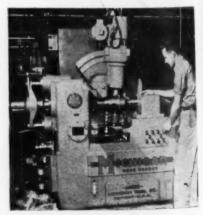
Flexible high-speed hobber boosts gear output.

A production hobber with quick changeover features permits high output of moderate length runs of aircraft spur gears at Pratt & Whitney Aircraft, Div. of United Corp. Called an Ultra-Speed hobber, the machine is built by Michigan Tool Co., Detroit. A variety of spur gears within the Ultra-Speed's work range can be hobbed but, to attain maximum efficiency, changeover time must be held to a minimum.

Changes Are Simple

To make a change from one spur gear to another of different diametral pitch and number of teeth, all that is required is the removal of the hob and the replacing of the proper ratio gears, and the removal and replacing of the hob speed gears, if necessary.

Fixtures are then taken off and replaced with the next set, all this requires is the removal and replacing of four bolts, each on the headstock and tailstock. Spacers on the yoke ends are changed if it is necessary to change the relation of the gear to the hob. All that remains are operator adjustments.



Less changeover time . . .



The exceptionally heavy and rugged underframe construction of these cars classes them apart for bonus performance... trouble-free operation and years of added service. For 70-ton requirements (170,100 lbs. load limit) these CFC REBILT flat cars are premium buys for you.

To meet requirements where nominal capacity demands are under 50 tons (132,-100 lbs. load limit) these cars are available with 50 ton trucks. Thus, substantial initial cost-of-car savings are effected as well as the cost of hauling the weight of heavier trucks.

GENERAL SPECIFICATIONS

	70 TON	50 TON
Capacity, Nominal:	140,000 lbs.	100,000 lbs.
Light Weight Approx.:	39,900 lbs.	36,900 lbs.
Load Limit:	170,100 lbs.	132,100 lbs.
Length over strikers:	40 ft. 6 in.	40 ft. 6 in.
Width:	9 ft. 6 in.	9 ft. 6 in.
Trucks:		
Capacity, Nominal:	70 TON	50 TON
Side Frames:	Cast steel,	Cast steel,
	full U section	full U section
Wheels:	33" dia. steel	33" dia, cast iron
Axles:	6" x 11"	51/2" x 10"

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Opposed spindle drill_speeds multiple hole production.

An unusual type of semi-automatic, hydraulically controlled machine tool has been developed to speed drilling operations on medium sized and large metal parts in both small lot and semimass production quantities.

The "opposed spindle drill" combines the speed of a two-way drilling machine with the flexibility of a radial drill and the accuracy of a horizontal boring machine.

Closely spaced holes that would prevent conventional multiple drill head and bushing plate drilling methods are simply produced on the Hill opposed spindle drill.

More Drilling Handled

The machine, developed by Walter P. Hill, Inc., Detroit, can be readily adapted to production drilling operations on medium sized and large parts in a wide range of industrial applications. It is particularly adapted to drilling operations on a wide range of sizes of tube sheets in condensers, chillers, heaters, evaporators and coolers.

Condenser tube sheets and baffles can be drilled by the Hill opposed drilling process in 1/10th the time required by conventional layout spotting and radial drilling methods, depending upon thickness and other variables.

What the Machine Is Like

Basically the machine consists of two fabricated steel vertical structures, each supporting two columns and mounted opposite one another on a welded steel base. The machine table is traversed on ground steel ways on the base between the two structures.

Motorized power heads having integral hydraulic feeds are mounted on each vertical structure. These units can feed individual drills or drill heads at varying speeds into opposite sides of the work at different levels.

Power heads are positioned vertically by twin hydraulic cylinders that are guided on the two ground round columns. The Hill heads are designed to resist 23,000lb unbalanced thrust loads.

Heads Positioned Vertically

The machine table is fed between the spindles by a single hydraulic cylinder. Horizontal table location as well as vertical location of each head is controlled by visible flush-pin type locators that work in conjunction with individual index plates.

A single Hill hydraulic power pack unit, which includes a motor, 1,000 psi pump and a tank, provide hydraulic power for the machine.

To drill the 1200, 34-in. dia holes located on 15/16-in. centers in a 5-ft dia, 4-in. thick forged steel condenser tube sheet, the sheet is bolted in position on a

Turn Page



SBS Waterless Washstations are complete units for hand washing on the job. Because they dispense SBS-30 Waterless Skin Cleanser, these Washstations require no plumbing . . . SBS-30 is simply rubbed on the hands and wiped off along with all the soil.

- In Trouble Spots Avoids workers use of irritating, harmful solvents. Quickly and safely removes tars, greases, paints, varnishes and other hard-to-remove soils.
- On the Production Line Cuts to a minimum costly interruptions for hand washing.
- Actually Earn You Money By eliminating one unnecessary trip per day for hand washing by only 10 men, you can save up to \$720 annually.

Fill out and mail coupon below for complete information about SBS Waterless Washstations and our 30-day no-risk money back trial offer.

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Washstation and your 30 day no-risk money back trial offer.

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WORM GEARS • RACKS • PINIONS

Backed by the experience of more than 60 years of gear-making, Simonds is properly equipped to match your most exacting specifications . . . is properly located to assure prompt delivery to most industrial areas. Simonds' custom service is available for heavy-duty gears ranging up to 145" in diameter—in cast or forged steel, gray iron, mechanite, bronze, rawhide and bakelite.



Technical Briefs

winged fabricated steel fixture on the machine table. This fixture is designed to accommodate tube sheets varying from 2 ft to 6 ft in diameter and up to 6 in. thick.

Next, power heads are positioned to locations corresponding to the horizontal centerline of a row of holes. This is accomplished by moving each head by means of a hydraulic valve control until a flush pin locator drops into position in the vertical index plate.

On this setup, one head drills the holes in the upper half of the condenser and the other drills those in the lower half. The heads are locked in position for the drilling operations on each pair of horizontal rows of holes.

Press Column:

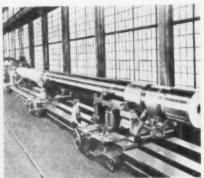
Making big columns for heavy presses poses problems.

Big columns built for heavy presses being developed as part of the overall big press program, have placed unusual demands on fabricating and machining facilities.

Typical of the big columns which are being made, are those for the Mesta 50,000 ton hydraulic die forging press.

Column First Forged

Each column is forged from an ingot weighing over 500,000 lb. The columns are approximately 76 ft long and are being machined on a Mesta 96-in. heavy duty turning and boring lathe to a diameter of 40 in. Before finishing, 10 in. diam holes were bored through the entire length by trepanning from both ends of each column.



Big press column . . .

Turn Page

Alloy Trouble?

If you have missed the special Iron Age Series of five articles on boron steel which appeared last July and August you may want to order a reprint.

A 30-page reprint booklet covers the following:

- Recommended alternates for standard grades.
- 2. Advantages and limitations of boron steels.
- 3. Hardenability charts.
- 4. Case studies of boron steel use in plants making gears ... pinions ... springs ... bolts ... axles.

A limited quantity of reprints is still available.

PRICE 50¢ EACH

Address: Reader Service Dept.

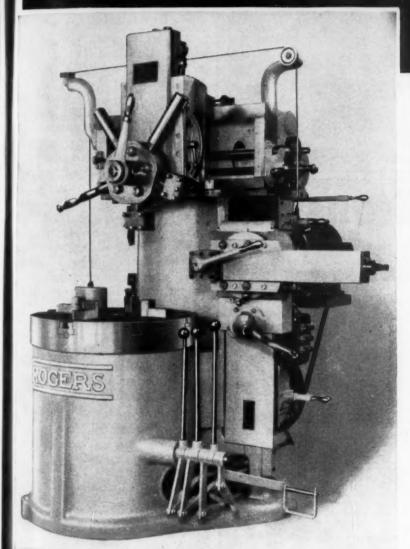
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Technical Briefs

Pulley:

Big electro-magnetic unit installed to remove tramp iron,

One of the largest electro-magnetic pulleys in the world, 60 in. in diam with a 48-in. face, was recently installed in the Oak Creek Power Station operated by the Wisconsin Electric Power Co. The pulley was built by Sterns Magnetic, Inc., Milwaukee.

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The pulley will magnetically remove all tramp iron from the coal used at Oak Creek to prevent damage to expensive crushers and other equipment.

New Lagging Method

Another unique feature of this pulley, other than its size, is the new method of lagging that has been developed for this type of equipment.

Lagging the material applied to the face of the pulley to increase its tractive effort in connection with long conveyors has been a problem to magnetic manufacturers because its thickness has reduced the effective magnetic strength of the pulley.

The company has pioneered in the application of a new lagging which is a thin, tough strip of material with firmly embedded granules in it that provide three times the traction of rubber lagging without belt wear and permits maximum use of the pulley's magnetic strength.

The lagging is held onto the face of the pulley with an adhesive material that creates a bond of considerable strength and eliminates belt slippage in conveyor systems.



Removes tramp iron . . .

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- Automakers point for whopping first quarter output
- > But inventory hangover keeps new orders moderate
- > Scrap prices sag again; ingot rate at 87.0 pct

Steel sales officials who visit Detroit don't leave with a full order book, but they certainly get their optimism bolstered. The automakers are gunning for a big first half in 1954. And steel producers are banking on auto output to pace their market.

Automakers insist they'll turn out 5 million or more cars in 1954, compared to about 6.2 million this year. Moreover, very heavy output is scheduled for first quarter—especially by the Big Three. Both Ford and Chevrolet have scheduled higher production runs for first quarter than they did for first quarter of this year. Others are matching 1953's near record pace in scheduling for early '54.

If they are too optimistic and sales bog down badly in the first 6 months, the bright steel outlook will darken quickly.

But if sales prove disappointing auto companies still have some aces up their sleeves. Some of the features of the fancy models that are more in the nature of "dream" cars today may be dragged out and put into production to stimulate sales.

Despite a spurt of "late" orders for January, some steelmakers are disappointed by the limited volume of business they have been able to book for that month. Hedging by some big customers (including auto producers) is disturbing steel producers about as much as low order volume.

Inventory correction is still the dominant factor in the market. It is taking some plants longer than had been anticipated to work off heavy steel stocks. Big customers hedging on January orders still insist they'll be back in the market in a big way for February and March. So these months will be crucial.

Thousands of man hours are being spent by steel companies on the problem of freight absorption. During the past several years, with practically all steel sold on an f.o.b. mill basis, freight rates were largely the worry of consumers. Consequently, the task of keeping up-to-date figures on rail, truck, and water freight costs on finished steel was neglected. Now that producers are finding it

desirable to absorb freight to participate in some markets freight costs are again of prime importance.

Traffic departments of some steel companies have been working overtime and Saturdays and Sundays bringing their freight rate books up to date. One large company has just about completed freight compilations on its own product origins and destinations. It is now speeding work on rates from competitive producing points.

Freight absorption, as might be expected, is on the increase. Many large steel buyers have been able to wangle some equalization concessions. The complexities of figuring out how much freight to absorb (on what products to meet what competition where) are more perplexing than ever before.

Scrap prices sagged again this week. The Iron Age Steel Scrap Composite Price fell \$1 a ton to \$33.83 per gross ton.

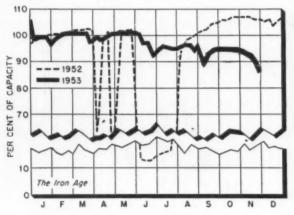
Steelmaking operations are scheduled 87.0 pct of rated capacity, unchanged from last week's revised rate.

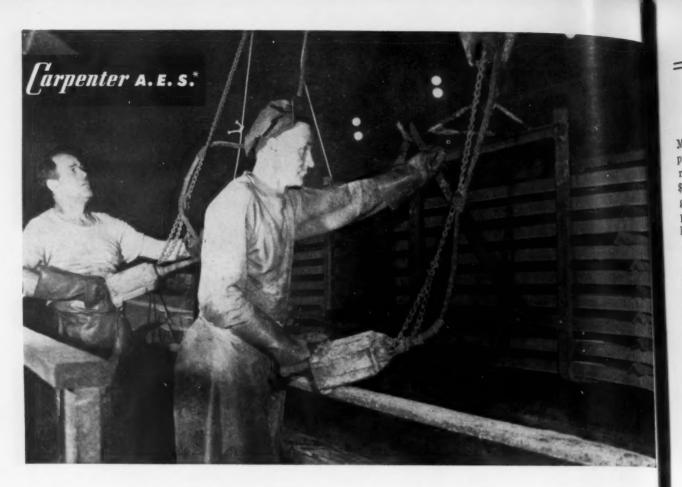
Steel Operating Rates

	Week of Nov. 29	Week of Nov. 22		Week of Nov. 29	Weak of Nov. 22
Pittsburgh Chicago Philadelphia Valley West Cleveland Buffalo	81.0 94.5 91.0 84.0 90.0 87.0 99.5	80.0 95.0 91.0 90.0* 89.5* 92.0* 99.5	Detroit Birmingham Wheeling S. Ohio River St. Louis East AGGREGATE	89.0 96.5 91.0 81.0 85.0 89.0	89.0° 96.5 76.0° 77.0 99.0 89.0° 87.0°

Beginning Jan. 1, 1953, operations are based on annual capacity of 117,547,470 net tons.

* Revised





Industry Solves a Hot Problem



Another example of how Carpenter *Application Engineering Service is helping industry cut costs.

Handling hot acids can be a dangerous and costly proposition for both men and equipment. A sudden splash or a spray of searing liquid...and

workers are on the receiving end of serious burns. What's more, caustic acids, biting into equipment and process lines, cost even more in shut-downs and loss of production.

To help overcome problems like this, Carpenter metallurgists developed a new stainless designed specifically to resist the corrosive action of hot sulphuric acid. The photo above shows just one application for this super Stainless, Carpenter No. 20. It shows hangers supporting heavy loads of pole line hardware during pickling in 15% H₂SO₄ at temperatures up to 200°F. Obviously, this equipment *must* be dependable in

resisting corrosion. And that was the problem. At one time these racks were made from ordinary steel and lasted only a short time before failing.

Then the company called on Carpenter, and Application Engineering Service went to work. Results: the new No. 20 racks adequately protected workers...gave dependable performance for many years!

Here's one more example of how Carpenter Application Engineering Service works alongside industry to improve products, reduce operating costs. It's a service backed by almost 70 years of leadership in specialty steel development. It has enabled Carpenter customers to be *first* to profit from a pioneering program involving new and better steels that make possible the "impossible". If *your* shopmen aren't familiar with A. E. S., perhaps you are the one to introduce them to it. A. E. S. goes to work in your shop as soon as you contact your Carpenter Mill-Branch Warehouse or Distributor. THE CARPENTER STEEL COMPANY, 121 W. Bern St., Reading, Pa.



Carpenter

Tool, Alloy and Stainless Steels

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research

Markets at a Glance

Lowers Sheet Prices . . . Reeves Steel and Manufacturing Co., Dover, O., has reduced prices on galvanized and hot-rolled sheets. Hot-rolled sheets, 19 gage, have been lowered from \$5.825 to \$5.05 per cwt. Galvanized sheets, 10 gage, have been lowered from \$5.525 to \$5.275 per cwt. New prices are at lowest competitive levels in the area.

Antimony Prices Reduced . . . Price of antimony was reduced 6ϕ per lb last week by National Lead Co. New price is 28.5ϕ per lb for R.M.M. brand, in bulk, f.o.b. Laredo, Tex. Last previous reduction was on Nov. 3 of last year when price was lowered 4.5ϕ per lb to 34.5ϕ per lb.

Will Push Metals Research . . . Westinghouse Electric Corp. will build a new metals development plant at Blairsville, Pa. Scheduled for completion by late 1955, plant will be devoted to metallurgical development and pilot production of special alloys and castings. Initial employment will be approximately 200. Development work will supplement but not duplicate specialized metallurgical research now being carried on by the company's aviation gas turbine, atomic power and lamp divisions.

British Need Plate... Plate is now about the only British steel-mill product which is still in short supply. Shipments to users have improved over the last few months, but there are still complaints and it is suggested that the need exists for a new plate mill capable of producing not less than 560,000 net tons a year. It is expected that 2,700,000 tons of carbon steel plate will be produced this year.

Shut Down Furnaces . . . All five openhearths of Bethlehem-Pacific at Seattle were shut down this week for long-overdue maintenance work. Rolling mill will continue operation on an inventory of ingots built up over the past few months and shutdown is expected to last all week with start-up of furnaces early next week.

British Jet Steel . . . Development of a new steel, which has been named "Fortiweld" is reported by the United Steel Companies, Ltd., Sheffield. A low-carbon molybdenum steel with boron addition, it has a tensile strength of 40 tons per sq in. combined with ease of welding. Capable of withstanding stresses two or three times those of mild steel, "Fortiweld" has been used in aircraft jet engines and special tubing.

Will Buy Copper... General Services Administration will buy 18.7 million lb of refined copper in the next 2 years from Howe Sound Co., New York. The firm will produce ore from its "high cost" Holden Mine, Chelan County, Wash. Agreed price is 31.5¢ per lb, f.o.b. common carrier's conveyance within stipulated western states. Approximately half the quantity called for must be delivered on or before Dec. 31, 1954.

Will Make Seamless Tubes . . . Barium Steel Corp. plans to produce seamless tubes in sizes heretofore available only from foreign steel producers. The tubes will be produced at Phoenix-ville, Pa., by Barium's subsidiary Phoenix Iron & Steel Co. Dr. Albert Calmes of Milan, Italy, has been placed in charge of construction and engineering of the heavy wall and mechanical seamless tubing mill which will use his process. Contracts have been let with Innocenti, S.G., Milan, for specialized equipment for the mill.

Decisions, Decisions, Etc.... Freight absorption is giving a lot of people the willies—most of all steel sales and traffic people. Traffic departments have been working overtime bringing obsolete rail, truck and water freight rates up to date. Sales people can't make a decision until they know their own, as well as competitors' charges. Decision made today might have to be reconsidered tomorrow. Company legal departments keep decisions difficult by turning thumbs down on anything that might appear systematic.

Blown In . . . Blast furnace No. 4 at the Duquesne works of U. S. Steel Corp. was blown in Nov. 20 following a shutdwn since May 28 for patch repairs.

Prices At A Glance

(cents per lb unless otherwise noted)

Composite Prices	This	Last Week		Year Ago	
	4.632		0	-	
Finished Steel, base					
	556.59	\$56.59	\$56.59	\$55.26	
Scrap, No. 1 hvy.					
(Gross ton)	33.83	\$34.83	\$35.33	\$42.00	
Nonferrous Metals					
Aluminum, ingot	21.50	21.50	21.50	20.00	
Copper, electrolytic	29.75	29.75	29.75	24.50	
Lead, St. Louis	13.30	13.30	13.30	13.80	
Magnesium, ingot	27.00	27.00	27.00	24.50	
Nickel, electrolytic	63,08	63.08	63.08	59.58	
Tin, Straits, N. Y	83.50	86.25	81.50	\$1.21%	
Zinc, E. St. Louis	10.00	10.00	10.00	12.50	

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Air Force Asks Big Titanium Growth

Calls present 2300-ton annual output "woefully weak" . . . Air Force wants 35,000 tons a year by '56, says it would need 100,000 tons yearly in war—By R. L. Hatschek.

"Woefully weak" is the description applied by Air Force Secretary Harold Talbott to the U. S. titanium supply. In his testimony before a Senate subcommittee investigating shortages of strategic materials, he stated his belief that immediate steps should be taken to improve this supply.

Air Force cooperation was promised and the need for cooperation of all armed forces was stressed. "Every assistance should be given to all potential producers of the metal," he added.

Want Vast Increase... Production goal of 35,000 tons set earlier by Defense Dept. was shaved to 22,000 tons. Since then Office of Defense Mobilization has authorized General Services Administration to contract for 25,000 tons of capacity. So far contracts have firmed up for 13,800 tons of annual capacity.

Current production is at the rate of approximately 2300 tons per year.

Earlier testimony by Air Force officials indicated that 35,000 tons of titanium per year by 1956 will be needed to turn out military aircraft now on the drawing boards. For an all out war the Air Force said it would need 100,-

MONTHLY AVERAGE PRICES

The average prices of the major nonferrous metals in November, based on quotations appearing in THE IRON AGE were as follows:

	Cents
	Per Pound
Electrolytic copper, Conn. Va	Hey 29.750
Lake Copper, delivered	
Straits tin, New York	83.105
Zinc, East St. Louis	
Zinc. New York	
Lead, St. Louis	13.30
Lead. New York	

000 tons of the metal per year.

Air Force recommendations received wide support from industrial officials at the hearings.

Need New Process... Titanium, which would be used to fill the gap between aluminum and steel in aircraft use, is still too expensive for widespread use in industrial or consumer products. As sponge it costs \$5 per lb, rolled out into sheets the price is \$15 per lb.

What is needed is a replacement for the expensive Kroll process in which titanium chloride is reduced by magnesium. Several firms are seeking an electrolytic method. Senator Malone, head of the investigating group, questioned the lack of exchange of in-

Clarify "Buy American"... Acting at the request of the aluminum industry, Defense Dept has spelled out what aluminum is and what aluminum isn't exempted from the "Buy American" Act. The exception is limited to pig and ingot.

But semi-fabricated metal purchases by the U. S. will continue to be determined on a "case by case" basis. If it is "in the public interest" foreign mill products may be bought. The clarification is merely a restatement of the June, 1952, order pointing out to the armed forces that domestic purchase takes precedence.

But loopholes like the above are big enough to sail a shipload of metal through.

Set Kitimat Start . . . Aluminum Co. of Canada says that the first phase of production will start at its new Kitimat smelter in late spring or early summer. Production goal for 1954 is 40,000 tons. Initial capacity of 90,000 tons annually leaves room for eventual capacity of 550,000 tons.

This firm is shipping metal to Aluminum Co. of America under the contract which is subject of a Justice Dept. suit. The quantity, however, is only about the same as Alcoa would be buying anyway so the government hasn't slapped on a "cease and desist." Just when the case will hit the courts is unknown—but probably won't be until next year.

Chilean Copper . . . Latest development in the copper dickering is that a Chilean government committee has generally approved of the U. S. State Dept. proposal with apparently not too much alteration. It has gone to the Chilean Senate and action there seemed imminent at presstime. If the proposal is approved the next step will be reopening of U. S. talks.

NONFERROUS METAL PRICES

(Cents per 1b except as noted)

10	enis per	in except	as norea,			
	Nov. 25	Nov. 26	Nov. 27	Nov. 28	Nov. 30	Dec. I
Copper, electro, Conn.	29.50-		29.50-	29.50-	29.50-	29.50-
	30.00		30.00	30.00	30.00	30.00
Copper, Lake delivered	30.125		30.125	30.125	30.125	30.125
Tin, Straits, New York	85.50		85.75		83.50	83.50*
Zinc, East St. Louis	10.00		10.00	10.00	10.00	10.00
Lead, St. Louis	13.30		13.30	13.30	13.30	13.30
Note: Quotations are going						
*Tentative						

- . NON-FERROUS METALS
- ORES AND MINERALS
- METALLIC RESIDUES
- METAL SCRAP

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- FERRO ALLOYS
 - ZINC

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December 3, 1953

December Forecast Dull, Cloudy

Scrap prices continue downward movement in most districts ... Slow market expected for rest of year ... Iron Age composite off \$1 to \$33.83 ... Rail strike hurts some mills.

Cold December winds blew through the scrap trade in most buying centers this week and gray-sky thinking prevailed. Steelmaking grades were off \$1 to \$2 generally, and most other grades reflected the trade's pessimism.

Mill orders were small, even at lower prices, and demand was expected to stay low until January orders were placed. Generally high inventories threatened that next month's orders would also be small, and last week's rail strike in the Pittsburgh district further slowed consumption there. The Iron Age Steel Scrap Composite fell \$1 to \$33.83.

Pittsburgh—Activity is at low ebb in the Pittsburgh market. A low ingot rate offered little hope for the immediate future. Only bright spot is a report that a major producer is considering purchase of a limited tonnage. General tone of the market is weak. Prices held steady with exception of No. 1 RR and RR specialties, which were off \$1 per ton on appraisal.

Chicago-Blue Monday in Chicago found buying at a low ebb, with asking prices beginning to sink. Outlook for the rest of the year was judged to be no better. An expected large purchase dribbled into small quantity orders, with the large percentage of local consumers indicating they'd need little scrap before January. Chicago's worst snow to date didn't perk up scrapmen's spirits at either the dealer or broker levels. Rail prices continued to hold, and brokers were pinched between high buying prices and falling selling prices for No. 1 steel-making grades and some railroad specialties. Turnings, while still holding a fair asking price, are very dubious, and are expected to slip in the near future. Mill buying is, without exception, in small quantities.

I hiladelphia—With all mills either out of the market or taking only small tonnages for December, this month will be one of the slowest. Truck tonnages, small as they are, are looming larger in this contracted market and are reflected by the lower range of this week's quotation. Other prices are off on appraisal of all market factors.

New York—Year-end inventory adjusting and general softness in surrounding areas have contributed to the slowness of this market. Trading is practically nonexistent and prices of steel grades and turnings are off \$1 to \$2 on appraisal. Cast grades held steady this week.

Detroit—There is not enough buymg of scrap in Detroit to substantiate most prices, but steelmaking grades dropped \$1 to \$2 on the basis of bidding on industrial lists. Automotive bundles brought substantially less than last month's lists, justifying the drop. The market is definitely weaker and there is only slight hope that Winter weather will bring some demand into the market here. Electric furnace cutbacks have given low phos the worst setback of all grades.

Cleveland—Scrap outlook here got even cloudier this week as most items dropped \$1 in Cleveland and the Valley. Both automotive and railroad lists were going at lower prices. Cleveland turnings remained unaffected by the general slip. Only vague rumors of a possible buy in mid-December kept pessimism from being rampant.

Birmingham—The steel scrap market continues dull with little demand for anything but cast. Two southern foundries have filled their needs and stopped paying premium prices for cast west of the Mississippi and north of the Ohio Rivers. Others are still paying \$2 extra for this scrap but

have not raised prices for cast from the Southeast. Brokers predict the scrap market will be slow the remainder of the year.

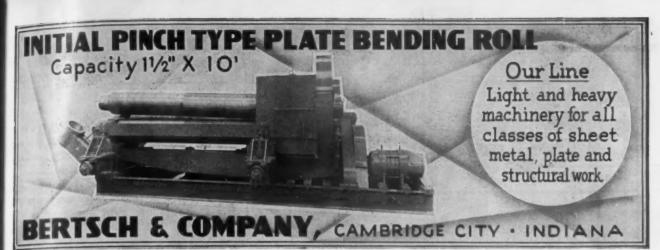
St. Louis-Leading mill is expected to come into the market for December shipment of heavy melting steel and bundles. In the meantime prices on these items are unchanged. Railroad lists closing last week were about \$2 a ton off. Mills are said to be "comfortably fixed" in their inventories for the winter season and not much buying is expected until after the turn of the year. Rails 18 in. and under are up \$2 a ton on small buying and on adjustment of prices. There was said to be no market for cast iron car wheels and prices are off \$2 a ton.

Cincinnati—Openhearth grades and turnings fell \$2 in this area on the basis of December buying schedule issue by one consumer in an adjoining area. Cincinnati dealers will not get any of this tonnage and must depend on water shipments to outside areas. Movement of scrap by barge doesn't appear likely, as weakness also pervades most other scrap centers. Local consumption apparently will remain at a standstill for the rest of the year.

Buffalo—Berries sentiment dominates this market. Prices generally declined \$2 a ton. Cast escaped the decline as sales were reported within prevailing ranges. No new business was reported in steelmaking grades as the area's top mill buyer delayed entering the market for new purchases. The mill, however, let it be known that prices would be lower if it bought. Another leading mill extended an embargo on shipments.

Boston—Complete lack of interest by consumers has depressed prices on several openhearth and blast furnace grades. Small quantities of electric furnace material are moving locally but otherwise the market is in the doldrums.

West Coast—Prices for December are expected to be unchanged but tonnage may be somewhat reduced. Cast market continues strong.



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December 3, 1953

RE-NU-BILT GUARANTEED

ELECTRIC POWER EQUIPMENT

- *			
D.	C.	MOTORS	

Qu.		Make	Туре	Velts	RPM
1	2200	G.E.	MCF	600	400/500
1	2000	Whae.	Mill	600	230/460
1	940	Whae.	QM.	250	140/170
1	900	Whse.		250	450/550
1	825	Whise.		20	95/190
1	600	Al. Ch.	20 212	250	100/800
1	500	Whse.	CC-216	600	300/900
1 2 1 2 1	450	Whse.	3.67333	550	415
1	400	G.E.	MCF	550	300/1050
2	300	Whse.	CB-5094	250	575/1150
1	200/300	G.E.	MPC	230	360/920
1	200	Rel.	1970T	230	720
1	200	Whse.	CB-5113	250	400/800
1	150	G.E.	****	600	250/750
1 8 1 1 1 2 1	150	Cr. Wh.	65H	230	1150
8	150	Cr. Wh.	83H-TEFC	230	960
1	150	Whee.	8K-151B	230	900/1800
1	150	Whse.	SK-201	230	360/950
1	50/120	G.E.	MCF	230	250/1000
2	100	Whse.	8K-181	230	450/1000
1	100	G.E.	CDP-115_	230	1750
		MILL	& CRANE		
1 4 3 1	50	G.E.	CO-1810	230	725
1	20	Whae.	K-5	230	975
4	15	Whae.	K-5	230	630
3	10	C.W.	SCM-AH	230	1150
1	10	G.E.	MD-104	230	400/800
3	6.25	Whse.	K-3	230	680
3 4	3	C.W.	SCM-FF	230	1750
2	3	Whee	HK-2	230	835

A.C. MOTORS

3 phase-60 cycle

M-G Sets-3 Ph. 60 Cy

1 500 Whise 1200 125/250 230 1 400(3U) Cr. Wh. 1200 125/250 230 1 150 Whse. 1200 275 230 1 140(3U) Cr. Wh. 690 125/250 440/230 1 100 G.E. 1200 250 2300/400	and \$20 test that they had been seed and they had been been been been been been been bee	400 (3U) 150 140 (3U) 100	G.E. G.E. G.E. G.E. G.E. C.W. Whse. G.E. G.E. Whse. C.W. G.E. Whse. C.W. G.E. Whse. Cr. Wh. Whse. Cr. Wh.	514 514 720 600 514 900 900 900 900 720 720 720 1200 1200 690 1200	125/250 125/250 275 125/250 250	A. C. Volts 02 2300 / 4600 11000 6600 / 13200 6600 / 13200 6600 / 13200 4600 41200 4160 4160 4160 4160 4160 4160 4160 41
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FREQUENCY CHANGER SETS

en	80 040	20 1	-	
Qu.	KW	Make	Freq.	Voltages
1	12500	Whse.	25/60	13200/13206
1	3000	G.E.	25/60	2300/2300/4000
2	2500	G.E.	25/62.5	2300/2300
1	1000	G.E.	25/58.3	4400/2300
1	500	Al. Ch.	2560	11000/2300

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NEWS OF USED AND REBUILT MACHINERY

Market Gets Better . . . Used machine tool business in the Chicago area may not be booming, but at least it's better. After a very dull summer, the pick up came in September and October.

Dealers admit this was not a skyrocket rise but they are happy to see any kind of improvement. Activity began to slow again in early November, but fourth quarter business should still be better than it was during the summer.

Stocking Up . . . One new trend has become apparent. Dealer inventories of used machinery are climbing and their purchases are increasing.

This development is not necessarily an indication that dealers anticipate a hot market in the first quarter, however. It's just a sign that prices have dropped sufficiently to make buying somewhat more attractive. Some used tool men say the drop in prices they are paying and getting is about 20 to 30 pct under last year's levels.

Forced Out . . . The same situation does not exist in the auction field, however. As one dealer pointed out, it takes only two people to keep a bidding price prohibitively high. Although more dealers are beginning to drop in at auctions, most are making their purchases through normal trading channels.

One reason dealers are turning up at auctions in greater numbers, even though they don't buy much, is that they hope there may be a sudden price break. They think sooner or later there'll be an auction where the bidding stays low and they want to be on the spot when this happens.

Some of these dealers say that if auction prices do drop suddenly, they are likely to stay down in the area from that date on.

Freight Reclassification . . . Applications for freight reclassification on used machine tools have been filed. Hearings have been set

for January with at least two public sessions scheduled, as rail and truck rates will be studied individ.

Reclassification could be a real boon to used machinery dealers. Although with the market still sick there is no great volume of long hauls, a surprisingly large number of used machinery firms are making purchases at considerable distances from home. This is primarily because a fair amount of used machine tools, mainly older models dating back to the '30's. have been offered and some deal. ers are adding these to their inventory.

Some sources believe the stream of machinery that is now hitting the open market will last into the middle of 1954. It is then expected to slow up as manufacturers finish trimming surplus equipment on production lines.

Tempo Mounts . . . Result of the easing supply of machine tools and the slide in prices is increased market activity as tools leave plant lines and show up on shop floors along Machinery Row.

Some dealers are eveing first quarter '54 optimistically. They expect the summer to be slow again, but are hoping the early part of next year will see an upsurge in used tool buying. If this comes about, they'll have the inventory needed to cover demand.

Want Machinery . . . South Korea has expressed interest in getting as much rehabilitation aid as possible from the U.S. to purchase American machinery. At a meeting of the Export Managers Club last week, Col. Ben C. Limb, head of South Korea's mission to the United Nations, and Dr. P. W. Han, commercial counselor at the Washington Embassy, said the equipment is needed to help Korea meet demand for consumer goods.

Dr. Han said his country has a strong preference for U. S. machinery and is willing to pay premium prices for it.